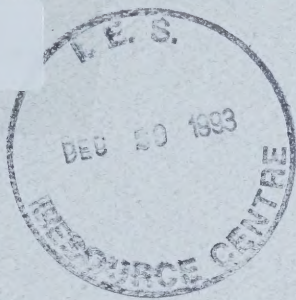


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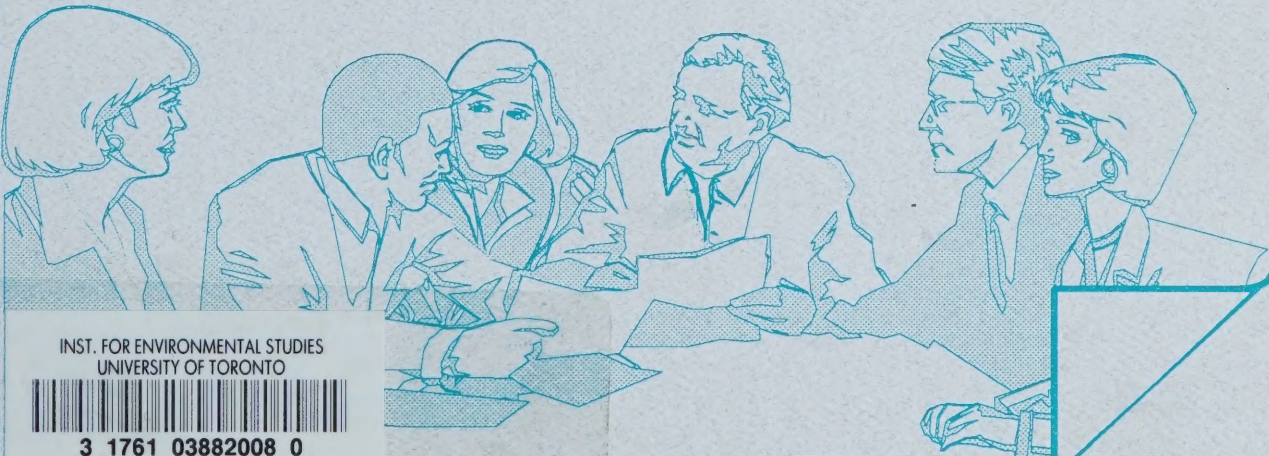
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Environmental Protection

Regulatory Review

Discussion Document



INST. FOR ENVIRONMENTAL STUDIES
UNIVERSITY OF TORONTO



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NEXT STEPS

Phase 1 of Environment Canada's review of its environmental protection regulations, the assembly of the findings, is now complete. The distribution of this report to interested parties constitutes the start of Phase 2, a period for public comment and consultation.

As a part of the Phase 2 consultations, discussions will be initiated with the provinces and territories. These discussions will recognize the

partnerships that exist between Environment Canada and the provinces in the area of environmental protection.

Discussions with environmental, business, industry, and labour groups will be facilitated throughout the course of Phase 2. To start, however, we encourage written comments from all interested parties. Please let us know your reactions to the findings of Phase 1 of the regulatory review.

Submissions should be addressed to:

Environment Canada
Departmental Regulatory Review Office
Ottawa, Ontario
K1A 0H3

Tel.: (819) 997-1089
Fax.: (819) 997-0449

Phase 1 - Internal Review

- The review is conducted and findings are published including the information base, the analysis, and the alternatives.
- The published results form the basis for public comment and consultation.

Phase 2 - Period of Comment and Consultation

- Comments are invited on the analyses and findings from Phase 1.
- Recommendations and conclusions will be formulated and published in early 1994.

Phase 3 - Follow-up

- Follow-up activities to effect the recommended changes to the regulations will be undertaken. This may include actions to revoke, and to streamline, simplify, rationalize, or otherwise improve regulations.
- Follow-up actions will also be taken to address the longer-term policy issues raised throughout the course of the regulatory review.

ENVIRONMENT CANADA REGULATORY REVIEW

ENVIRONMENTAL PROTECTION PROGRAM

A DISCUSSION DOCUMENT

OTTAWA
NOVEMBER 1993



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EXECUTIVE OVERVIEW

The review of Environmental Protection Program regulations began in November 1992. It is part of the government-wide review of regulations and competitiveness that was initiated with the 1992 February Budget. Environment Canada's review is being conducted in three phases – internal review, comment and consultation, and follow-up.

This report presents the results of the internal review as findings for discussion; only after consultation will the final recommendations and conclusions be drawn. This report initiates the comment and consultation phase for the review.

Thirty-five regulations were examined. These regulations were enacted under four acts: *Canadian Environmental Protection Act*, *Fisheries Act*, *International River Improvements Act* and the *Weather Modification Information Act*.

The review focuses on five areas: effects on competitiveness, support of environmental sustainability, regulatory effectiveness and efficiency, alternatives, and federal-provincial harmonization. Additional highlights are presented on priority setting and planning, legislation, and regulatory process and decision making.

Competitiveness

The review did not raise any significant competitiveness issues.

However, the review has identified where one set of regulations, in particular, may influence competitiveness. The PCB Waste Export Regulations forbid export of PCBs which limits options for disposal and increases storage costs and liability risks.

Due to the complexity of competitiveness and to shortcomings in available data, conclusions on whether Environment Canada's environmental protection regulations impact on competitiveness are not yet possible. Further research targeted to understanding the implications on specific industrial sectors is needed. Similarly, more analysis needs to be undertaken to better understand the implications of Canadian requirements compared to those of Canada's major trading partners. The question of cumulative impact, often raised by business and industry, includes consideration of environmental regulations imposed by the different levels of government in Canada, as well as of government regulation in general. Important as it is, consideration of the cumulative impact of government regulations on competitiveness is beyond the scope of this review.

Regulatory Effectiveness and Efficiency

The review suggests that three regulations – Potato Processing Plant Liquid Effluent Regulations, Meat and Poultry

Products Plant Liquid Effluent Regulations and Chlorofluorocarbon Regulations – and the part of the Fuels Information Regulations dealing with additives could be revoked.

Furthermore, the review indicates that the feasibility of consolidating the four regulations dealing with import and/or export should be examined; in addition, consideration should be given to grouping three ozone-depleting substances regulations into one regulation. As well, the value of creating a "banned substances" regulation could be explored to replace three current regulations dealing with Mirex, PBBs and PCTs. Future banned substances could be scheduled under this one regulation.

Environmental Sustainability

All regulations reviewed were found to promote environmental sustainability – a state where a healthy equilibrium is maintained in ecosystems.

Environmental effects monitoring (EEM) is seen as a means of defining and supporting environmental sustainability goals. The review suggests that it should be an integral part of environmental management. EEM is an essential element of the ecosystem approach; use of this approach to develop solutions to environmental stresses should be encouraged.

Alternatives

The review sees some potential for alternatives to the type of regulations

currently in place. More work needs to be done to identify their cost and environmental effectiveness in resolving environmental issues. Economic measures and voluntary standards adopted by other countries to achieve environmental objectives should be thoroughly studied to see if their adoption could promote competitiveness.

"Command and control" regulations were found to be essential, in particular where action is needed to protect from immediate serious threats to human health and the environment.

The review suggests that a mix of regulatory and voluntary activities may offer the most productive solutions to environmental problems.

Federal-Provincial Harmonization

Federal-provincial coordination should be at the top of the agenda for easing the environmental regulatory burden perceived by industry. The need to deal with overlap of federal and provincial regulations was suggested in several instances. The Canadian Council of Ministers of the Environment (CCME) is addressing harmonization as a priority.

A focus on identification of the extent of overlap with an itemized description would lead to opportunity to reconcile each case. Current efforts need to be reviewed and new, innovative approaches need to be pursued to eliminate the potential for future overlap.

Priority Setting and Planning

Priority setting and planning for environmental protection need to be determined at the national level. The effective use of capital for environmental purposes requires coordinated long-term federal-provincial direction that is well understood by the private sector. This initiative will increase the net benefits to society of Canadian environmental protection activity.

Legislation

The legislative review of the *Canadian Environmental Protection Act* (CEPA) will be conducted in a separate but complementary fashion. Among other things, it will provide opportunity for recommending changes to the Act to foster environmental sustainability and Canadian competitiveness. Changes to make equivalency agreements more practicable are an example.

The regulatory review suggests that the feasibility of amending the *Fisheries Act* to allow for federal-provincial equivalency agreements for pollution control regulations should be considered. Other concepts, ideas and approaches that emerge during the upcoming review of the CEPA should be considered under the *Fisheries Act* as well.

Regulatory Process and Decision Making

Three areas should continue to be emphasized: maintaining open and multi-stakeholder participation in developing Canada's positions at international environmental negotiations; early consideration of alternatives; and continued development of techniques associated with cost-benefit analysis especially in respect of benefits valuation. The objective of these efforts is to improve decision making.

PROGRAM FINDINGS

Chapter 3 - Competitiveness and Environmental Regulation

- 3.1 Conclusions on whether Environment Canada's environmental protection regulations impact on competitiveness are not yet possible. However, the review did not raise any significant competitiveness issues.
- 3.2 Further research is needed on the effects of environmental regulations on the competitiveness of particular industry sectors.
- 3.3 Priority setting and planning regarding environmental protection need to be determined at the national level.

Chapter 4 - International Considerations

- 4.1 The review found no evidence that Canadian industry's access to, and competitiveness in, international markets have been significantly affected by differences between Environment Canada's environmental protection regulations and those of its major trading partners and competitors. For the most part, industries in these countries face similar regulatory requirements.
- 4.2 More analysis needs to be undertaken on comparative environmental regulatory requirements of major trading partners to come to any firm conclusions on the subject.
- 4.3 Policy instruments, such as economic measures and voluntary industry standards, adopted in other countries to achieve similar environmental objectives should be thoroughly studied to see if their adoption could promote competitiveness.

Chapter 5 - Federal-Provincial Coordination

- 5.1 Federal-provincial coordination and harmonization should be at the top of the agenda for easing the environmental regulatory burden faced by industry. New, innovative approaches need to be pursued.
- 5.2 The review points to a continuing need to simplify the current environmental protection regime in Canada. Industry and others should know exactly who does what.

- 5.3 No evidence was found in this review to indicate that any of Environment Canada's regulations impose internal barriers to trade.

Chapter 6 - Achieving Results More Simply

- 6.1 Through CCME, a detailed comparison of federal and provincial environmental regulations could be initiated province by province to pinpoint areas where the effects of regulatory efforts are similar. Development of options to eliminate overlap would follow.
- 6.2 The feasibility of amending the *Fisheries Act* to allow for equivalency agreements with the provinces for the pollution control regulations should be examined. The objective of equivalency agreements would be to apply only one set of regulations where both federal and provincial regulations exist.
- 6.3 More effort should be devoted to understanding and monitoring the effects of industrial discharges on fish. Such work would place an additional burden on the scientific resources of the Departments of Fisheries and Oceans, and Environment.
- 6.4 Consideration should be given to revoking the Potato Processing Plant Liquid Effluent Regulations, the Meat and Poultry Products Plant Liquid Effluent Regulations, the Chlorofluorocarbon Regulations, and the additives part of the Fuels Information Regulations No. 1.
- 6.5 The review indicates that consolidation of the four regulations dealing with import and/or export could be examined; in addition, consideration should be given to grouping three ozone-depleting substances regulations into one set. As well, a "banned substances" regulation could be developed to replace three current regulations dealing with Mirex, PBBs and PCTs. This reduction of ten regulations to three could reduce burden on clients, and make administration of regulations simpler with no apparent negative environmental effects.
- 6.6 CCME should be asked to revisit the question of banning the export of PCB wastes. A regulation is now in place to ensure that importing countries consent to receiving hazardous wastes before they are shipped.

Chapter 7 - Cost-Benefit Analysis

- 7.1 Environment Canada should work with others to improve the methodology for estimates of the costs and benefits of regulatory initiatives. This will provide for better information in a timely way and contribute to better decision making.

- 7.2 Environment Canada should encourage the examination of issues surrounding the application of benefits valuation techniques.

Chapter 8 - Alternatives

- 8.1 The review of existing regulations shows some potential exists for replacing them with alternatives.
- 8.2 More analytical work needs to be done to identify the cost and environmental effectiveness of alternatives in resolving environmental issues and to promote their consideration at an early stage. The use of alternatives to "command and control" regulations in resolving emerging issues appears to offer good potential.
- 8.3 Voluntary action and industry self-regulation, including certifiable conformance with ISO standards, are of growing importance to companies interested in total quality management. They offer cost and time savings to governments and companies alike. Their potential use in environmental matters should be explored further.
- 8.4 "Command and control" regulations continue to be essential, in particular when action is needed to protect from immediate serious threats to human health and the environment.

This review of environmental protection regulations identifies where change is possible. The focus is on how Canadians can breathe new life into the national effort to maintain a healthy environment in the pursuit of prosperity. The aim is to make the system for environmental protection simpler and more responsive.

The regulations under review were created to address specific needs, sometimes as a result of environmental crisis and public concern. They represented best judgement based on information available at the time. In some cases, needs or circumstances may have changed. The review provides the opportunity to examine the efficiency of these instruments using information not available in the past.

The review has found that some regulations can be simplified and others consolidated. It calls for renewed cooperation between all levels of government. The Canadian system for handling environmental regulatory issues has areas of overlap. People affected by regulations are as concerned with the number of jurisdictions they must respond to as with the regulations themselves.

This report presents the results of the review as findings for discussion; only after consultation and comment have taken place will the final recommendations and conclusions be drawn.

The Regulatory Review

This review of the environmental protection regulations of Environment Canada is part of a federal government-wide exercise to examine factors that influence business competitiveness. The Canadian Wildlife Service regulations are examined in a companion document available from Environment Canada's Regulatory Review Office. A review of the Canadian Parks Service regulations was begun as part of the Environment Canada regulatory review; given the recent government restructuring, however, the Canadian Parks Service will now report its findings through the new Heritage Canada portfolio.

The objective of the review is to identify any regulations that may significantly hinder Canadian competitiveness or impose needless costs on consumers; it is to ensure that Environment Canada's regulatory framework operates efficiently and effectively. The review will also ensure that the federal government's commitment to health, safety, and the environment are maintained.

Environment Canada's review of its regulations began in November 1992. In carrying out this review, Environment Canada looked at the issue of competitiveness from various perspectives. Key questions included: Is government intervention in an issue still justified? Is regulation the best

available alternative? Do the regulations provide best value for money?

Environment Canada is in the business of ensuring that the government's commitments to the environment are realized. This mission was kept in the forefront during the review.

This department considers its regulatory review to be a unique opportunity to evaluate whether its regulations fit current environmental and economic challenges. It views vigorous discussion on environmental and economic issues as essential to improving policies and programs. Achieving both environmental and economic objectives is the very essence of sustainable development.

This notion of meeting today's needs without compromising the ability of future generations to meet their own needs was popularized by the work of the United Nations Brundtland Commission and endorsed by governments in Canada. It is taking root in industry and personal decision making. Sustainable development implies that there will be integrated consideration of environmental and economic factors when policies are made. Exploring and employing efficient and effective instruments to promote sustainable development are key objectives of the federal government's Green Plan. It is a guiding principle of this review.

Structure of the Report

Chapters 1 and 2 provide background information on the purpose and

process of the review and on the regulatory program being reviewed.

Chapters 3 to 8 present an overview of the issues investigated by the six review teams. In many instances, the findings in these chapters go beyond those of individual team reports and treat matters of significance to the regulatory program.

Chapter 3 provides an overview of competitiveness and its relationship to environmental regulation. Chapter 4 discusses international considerations. Chapter 5 presents information on federal and provincial responsibilities and considers issues of overlap between Environment Canada's environmental protection regulations and those of the provinces and territories. Chapter 6 identifies potential areas for streamlining, simplifying, and consolidating environmental protection regulations and for improving the environmental protection effort in Canada. Chapter 7 deals with cost-benefit analysis. Chapter 8 considers the question of alternatives.

Chapter 9 summarizes the findings of the review teams, regulation by regulation. It covers stakeholders' comments and review team analyses.

For ease of presentation, the findings of Environment Canada's review of its regulations related to weather modification and to international transboundary rivers are also included in this report. A total of 35 regulations were reviewed; Appendix 1 contains a complete list.

Organization of the Review

Departmental Regulatory Review Office

A Regulatory Review Office, reporting to the Deputy Minister, was established. It is responsible for the planning and conduct of the review, for administrative support to the review teams and the External Advisory Panel, for intergovernmental consultation, for the preparation of this document, and for the coordination of current and future consultations with provincial governments, federal government departments, and other interested parties.

External Advisory Panel

An External Advisory Panel was formed to provide the review with broad-based expertise from outside the Department. Its role is to serve as a challenge function and to provide advice and input to Environment Canada's review.

Members of the Panel are from business, labour, environmental groups, conservation groups, and industry organizations. They contributed their ideas and views on the review process and the emerging results. Appendix 2 contains a list of Panel members and their terms of reference.

Review Teams

The 35 regulations covered in this report were grouped into six clusters based on ease of client consultation. Review teams were formed to examine the regulations. Each review team had a team leader and four to nine members with regulatory, technological, and socioeconomic expertise. In addition, individuals from other government departments, including Health Canada; Industry Canada; Natural Resources Canada; and Fisheries and Oceans Canada were involved in the work of the review teams.

The review teams' objective was to assess the regulations against criteria developed for the Environment Canada regulatory review, consult with staff and stakeholders to create an information base, and develop team findings regarding each regulation. The criteria are reproduced in Appendix 3. An analysis of stakeholder views, both written and oral, was an integral part of their work.¹

Consultation and Information Gathering

To develop the information base needed for the review, some 2000 groups and individuals, representing business, labour, and environmental

¹Detailed team reports have been prepared. They are available upon request from the Departmental Regulatory Review Office.

groups, were asked to provide written submissions on the Department's regulations. In addition, each team asked for comments from numerous stakeholder groups with specific interest in its regulations.

The review teams communicated with these stakeholders throughout the review process. This ensured that input had been correctly recorded and kept interested parties up-to-date on the progress of the review. Environment Canada's regional offices also consulted with stakeholders. Provincial governments were informed of the review; several provided comments.

Many people expressed concern that the time frame for preparing comments was too short. As well, certain environmental nongovernmental organizations (ENGOS) expressed concerns about the purpose of the review.

In response, the then Minister of the Environment extended the deadline for comment by one month and reassured people of the government's commit-

ment to the environment. He added that the Department's regulatory review would ensure that environmental objectives and sustainable development would be promoted. The public consultation phase is initiated with the publication of this report.

Analytical Process

Regulations were assessed against the criteria established for the review. These criteria were developed by Environment Canada through federal interdepartmental consultation and vetted by the External Advisory Panel.

The criteria were designed to facilitate collection of information about the objectives, control measures, and history of the regulations, and about the comparable situation in the provinces and territories, and in other countries. They were also to assist in analyzing the impacts of the regulations. The criteria cover environmental sustainability, competitiveness, obsolescence, duplication, trade barriers, costs, benefits, and alternatives to the existing regulations.

The Government of Canada endorses the principle of sustainable development which recognizes that economic growth and development can go hand-in-hand with environmental protection and resource conservation. For a resource-based economy such as Canada's, better decision making in the whole area of environmental protection is vital if we are to sustain our resources and promote economic growth and well-being for the nation at large.

The Environmental Protection Service (EPS) is the lead agency for the federal government's efforts to avoid or minimize the creation of pollutants and wastes, to control their release, and to remedy their impacts on the environment. EPS is working towards sustainable development through the successful delivery of those Green Plan initiatives the Service is responsible for or is contributing towards.

Controlling and eliminating toxics, ensuring that environmental objectives are met, reducing wastes, preserving the ozone layer, improving air quality, promoting pollution prevention and emergencies preparedness, ensuring better decision making through environmental assessment, and encouraging public action through citizenship initiatives – this is the work of the Environmental Protection Service.

EPS works closely with other federal departments and acts in an advisory

capacity in areas such as pesticide registration, motor vehicle emissions and the transportation of dangerous goods. The Service is regularly in contact with other levels of government and participates in the many partnership arrangements developed collectively by the Canadian Council of Ministers of the Environment (CCME).

Much effort is being devoted to resolving areas of potential overlap between the federal and provincial jurisdictions. As well, EPS is the federal government's major representative to a number of international fora dealing with environmental protection initiatives. Building partnerships with interested parties to find effective solutions to advance the cause of environmental protection is central to the day-to-day business of the Environmental Protection Service.

Effective Environmental Protection

The Environmental Protection Service believes that better decision making based on sound science, public awareness and a clear understanding of goals, short-term and long-term, is the path to follow to a better environment. Environment Canada's Environmental Citizenship Program is a major vehicle for moving in this direction. The program is designed to enhance environmental awareness among individuals, organizations and communities and to build partnerships

which can lead to effective action to protect the environment.

Effective action depends upon better decision making and the involvement of Canadians in open and transparent consultation processes. The Environmental Protection Service is focussing on productive consultation with Canadians. In building partnerships through consultations, agreements and joint actions, efforts to effect EPS program delivery have a broader foundation for success.

Prevent Rather Than Cure

The three basic strategies for ensuring environmental protection are effective prevention, control, and remediation. Environment Canada's research facilities and its network of specialized laboratories support these thrusts.

Historically, the greater part of the environmental protection effort has been to clean up or rectify existing problems. Environment departments across all levels of government have made great strides over the past two decades in cleaning up and remedying the more obvious causes of pollution. New regulations, permits and licences limiting emissions and effluents have led to cleaner air in our cities and to improved environmental conditions in the industrial and resource sectors. There is no question that "command and control" regulatory initiatives are effective; indeed, there will always be a role for this type of intervention.

If, however, viable and sustained progress in environmental protection

is to be achieved, then Canada needs to accelerate its shift to prevention whereby further degradation of the environment is minimized, if not altogether eliminated. Government, the private sector and the public are already moving away from "react and cure" solutions to "anticipate and prevent" actions.

Preventive measures introduced early in the planning, design and operational phases of projects or industrial activity lead to efficient use of raw materials, energy, capital and labour. Pollution prevention initiatives help contribute to Canada's economic prosperity and environmental well-being.

In the shift towards prevention, the Environmental Protection Service is examining alternative approaches such as economic instruments and voluntary action. This will ensure a balanced use and combination of the tools available to effect environmental improvement. As well, the Environmental Protection Service is placing greater emphasis on voluntary approaches by industry and the public to achieve more cost-effective results.

Societal attitudes towards environmental protection and pollution prevention have changed dramatically over the last twenty years. The environment is now on the agenda in corporate board rooms with industry more attuned to the importance of environmental protection. The public has voiced its concerns and industry has begun to respond proactively.

A number of initiatives are being introduced by industry in a variety of sectors. For instance, in May 1992, a government-industry task force involving Environment Canada, General Motors of Canada, Ford Motor Company of Canada, Chrysler Canada and the Ontario Ministry of Environment and Energy initiated a project to reduce or eliminate discharges of toxic substances from Canadian automobile plants. To date, an initial inventory of 29 toxic substances that are being used, generated, or released has been completed. The task force is now developing plans to minimize discharges.

The Legislation

The Environmental Protection Service was created in 1971 to act as the control arm for the newly created Department of the Environment. This "control" focus continued for several years and was reflected in early Environment Canada legislation, in particular the amended *Fisheries Act*, the *Clean Air Act*, the *Environmental Contaminants Act*, and the *Ocean Dumping Control Act*.

The emphasis was on cleaning up visible pollution. The level of pollution control was generally determined with industry participation, based on the technical and cost limits associated with abatement technology available at the time regulations were being proposed. More recently, the pollution control provisions of the *Fisheries Act* were improved and the *Canadian Environmental Protection Act* (CEPA) was created in 1988 to provide a life

cycle approach to the management of toxic substances.

Canadian Environmental Protection Act

The Act incorporates parts or all of earlier statutes including the *Clean Air Act*, the *Ocean Dumping Control Act*, the *Environmental Contaminants Act*, and the nutrient provisions under the *Canada Water Act*. After CEPA came into force, the existing regulations from these Acts were rolled over and issued as regulations under CEPA. The rest of the *Canada Water Act* remains in force, and the other three Acts were repealed.

CEPA provides the federal government broad powers to protect Canadians and the natural environment. It is divided into six parts.

Part I enables the Minister to give long-term direction to environmental protection activities through research, monitoring, and federal-provincial cooperation in the establishment of objectives, guidelines, and codes of practice. These may relate to any aspect of environmental quality, to any activity affecting the environment, or to any activity affecting health, conservation, and sustainable development.

Part II promotes the control of the life cycle of toxic substances. Part II of CEPA is jointly administered by Environment Canada and Health Canada. This part is the most relevant to this review, since the majority of the regulations reviewed

was issued under its provisions. It allows the Ministers to gather information on substances, assess their toxicity, and issue regulations to control substances determined to be toxic according to the criteria established in the Act. This part of the Act details how these activities are to be undertaken, includes time frames for achieving results, and puts the onus on specific parties to ensure that action is taken. Control of the export and import of toxic substances and hazardous wastes, and of the import, use or sale of prescribed fuels is also enabled in Part II.

Part III allows for the making of regulations to control the concentration of nutrients in cleaning agents and water conditioners. Its purpose is to stop the eutrophication of lakes and rivers, but it is limited in that it can address only one source of nutrients contributing to the problem.

Part IV applies to federal departments, agencies, and Crown corporations as well as to federal works, undertakings, and lands. It enables the development of guidelines and regulations to protect the environment from normal, everyday federal operations, such as waste handling and disposal.

Part V deals with international air pollution. It sets out the conditions under which the Minister can recommend regulations to control Canadian sources of air pollution affecting another country. There is emphasis on deferring to provincial governments to put regulations in place, before

enacting federal regulations to resolve any identified problem.

Part VI prohibits disposal at sea unless specifically permitted. Applications are required and conditions must be met. Certain substances cannot be disposed of at sea; others have restrictions attached to them such as concentrations permitted. The location of disposal sites and disposal methods can also be controlled.

Fisheries Act

The Department of Fisheries and Oceans (DFO) is responsible for Canadian fisheries; it relies primarily on the *Fisheries Act* to carry out its mandate. One of Canada's oldest pieces of legislation, the Act was promulgated in 1868 and most recently revised in 1991 making its habitat protection provisions leading-edge.

Although the Minister of DFO retains legislative accountability for the *Fisheries Act*, under an administrative arrangement with DFO, Environment Canada has responsibility for administration of the Act's pollution control provisions. These include section 36(3) which prohibits the deposit of substances that are deleterious to fish; section 36(4) which permits deposits authorized by regulation; and section 36(5) which describes the type of regulation that can be made.

Under section 36(5), regulations can be made prescribing deleterious substances authorized for deposit, waters

where they may be deposited, the operations pertaining to the authorized deposits, the quantities or concentrations of deleterious substances authorized for deposit, other conditions, and the persons who may authorize deposits.

Other sections provide the power to inspect, to request plans and specifications, and to make interim orders with respect to operations depositing deleterious substances.

International River Improvements Act

The *International River Improvements Act* was promulgated in 1955. The

Act authorizes the Minister of the Environment to approve and to license projects on transboundary rivers that would affect water levels and flows at international boundaries.

Weather Modification Information Act

The *Weather Modification Information Act* was promulgated in 1974 and is administered by the Atmospheric Environment Service. The Act requires that those engaged in weather modification activities provide notice of their plans and report on their operations within specified time limits.

Concern over competitiveness is fuelling renewed consideration of the impacts of environmental regulation. At the heart of this debate is the commitment of the Canadian government to promote both environmental objectives and competitiveness. This debate is taking place amidst several emerging trends, including:

- increasing competition from low-cost suppliers of resources and manufactured goods, challenging traditional Canadian strengths;
- global trade and investment liberalization running hand-in-hand with the resurgence of protectionism and the growth of large trading blocs;
- an accelerating pace of technological change; and
- the growing strength of newly industrialized countries.

The long-term prosperity of Canada will depend on the ability to anticipate and respond creatively to a wide array of competitiveness issues. A key challenge for Canada is to achieve sustainable development which, in turn, ensures a healthy environment and a strong competitive economy.

Competitiveness is an elusive concept to define. In 1993, the House of Commons Standing Committee on Finance recognized two broad defini-

tions for national competitiveness: one emphasizes trade performance, the other stresses productivity performance.

Even after narrowing the range of competitiveness definitions as above, there are still difficulties in isolating empirically the effects of specific environmental regulations. A wide range of factors – including product and process technological innovation, raw material availability and costs, capital availability and capital investment patterns, tax rules, government regulations, exchange and interest rates, labour costs and skills, and trade barriers – influence competitiveness. Distortions in competition do not arise solely from one factor, but have to be considered in the context of the interaction of the range of factors.

The bottom line is that regulations are just one of many factors that influence competitiveness. Environmental regulations are only a subset of regulations in general.

The broad question of whether environmental regulation has a significant effect on competitiveness has yet to be answered conclusively. Recent assertions by Michael Porter that stringent environmental regulations enhanced competitiveness as well as the federal government's Prosperity Initiative have led to a growing body of opinion on the issue.

There are two contending perspectives.

Environmental regulations enhance competitiveness.

Properly designed, environmental regulations stimulate product and production process innovation, two of the major determinants of enhanced productivity. The trick is to use the right mix of regulations, market-based incentives, and voluntary standards that encourage innovation rather than dampen it. Markets are greening; companies that get out in front will have significant productivity advantages by climbing the learning curves in advance of their competitors. Environmental protection can lead to cleaner products, marketable by-products, reduced clean-up costs and liability charges, all cost reductions that translate directly into increased productivity. Environmental protection technologies are themselves saleable on international markets.

Environmental regulations impede competitiveness.

Investment capital is scarce; environmental regulations force capital away from productive investments into less productive ones. The arguments about side-benefits from environmental protection miss the point that other direct investments are even more productive. Environmental regulations cause considerable business uncertainty; the details

are slow in coming, and enforcement is spotty and unpredictable. Strict Canadian environmental regulations will force Canadian plants to spend more on environmental issues than their foreign owners. The Canadian branch plants will be closed. Command-and-control regulations, such as *Best Available Technology*, stifle innovation and offer no incentives for surpassing the regulated limits.

Debate on these two conflicting views continues. In many cases, shortcomings in available data severely limit the analyses possible.

Nevertheless, a body of empirical literature regarding the effects of environmental regulations on competitiveness, at least at the macro-economic level, is developing. For example, in the United States, research studies indicate that environmental regulations can cause:

- a small increase in Gross Domestic Product (GDP) in the short run;
- a small decrease in GDP in the longer run;
- a slight dampening of industrial productivity growth; and
- a small increase in the general price level.

Research, conducted at the aggregate level by the Organization for Economic Co-operation and Development (OECD), indicates that environmental regulation has little or no impact on

the overall competitiveness of countries, as measured primarily by trade balances and impacts of trade patterns. The OECD research found that compliance costs for environmental regulations are a very small portion of industry costs on average. For many industries, the cost of compliance was found to amount to a small proportion of total production costs, in the range of 2 to 3 per cent.

Although estimates of these broad economic effects shed some light on environment-competitiveness issues, they do not show industry-specific or region-specific impacts; these are important considerations in developing environmental policies. The OECD research found that regulatory compliance costs may have more important impacts on the competitiveness of particular sectors or firms, impacts that are not revealed in the macro-level studies. Their studies found that regulatory compliance costs for some industries were 10 per cent or more of total production costs.

Studies of Canadian and U.S. industries also have shown that regulatory impacts vary greatly across sectors. But few empirical studies of regulatory impacts on Canadian industries have been conducted, and further research is necessary.

What is clear is that there is a burgeoning environmental industry. The worldwide market for environmental goods and services is forecast to double from approximately \$300 billion to \$600 billion by the year 2000. The environmental in-

dustry in Canada earns annual revenue in the order of \$7 billion and employed in 1992 between sixty and seventy thousand workers. Recent studies conclude it has the ability to become one of the country's leading growth industries over the next decade, and to be a major exporter of goods and services.

Due to lack of available data, there are no neat and tidy conclusions to the question of whether Environment Canada's environmental protection regulations impact on competitiveness. No significant competitiveness issues were raised by business in this review. However, the review did identify some specific competitiveness impacts.

The External Advisory Panel pointed out that the differences in PCB regulations between Canada and the United States may have some negative impact on Canadian competitiveness. The issue is the ongoing liability to Canadian companies that own or are responsible for PCBs. PCBs cannot be stored for more than one year in the United States; in Canada the trend is towards long-term storage. Creating better and better storage facilities only increases costs, increases the risks of accidents, and prolongs dealing with the real issue – destruction and disposal.

The question of long-term planning and environmental priorities was raised by members of the External Advisory Panel. The gist of that discussion was the need for industry to know the long-term expectations of

governments regarding environmental protection and to come to agreement with governments on priority areas for effective use of capital devoted to environmental protection. Repeated references were made to the cumulative impact of regulations on competi-

tiveness. Overlap and duplication among levels of government cause inefficiencies; uncertainty regarding future regulatory requirements can make investors hesitant; and time delays incurred for approvals can lead to lost opportunities.

Findings

- 3.1 Conclusions on whether Environment Canada's environmental protection regulations impact on competitiveness are not yet possible. However, the review did not raise any significant competitiveness issues.
- 3.2 Further research is needed on the effects of environmental regulations on the competitiveness of particular industry sectors.
- 3.3 Priority setting and planning regarding environmental protection need to be determined at the national level.

Canada's prosperity is greatly affected by its trade performance with other countries. Environment Canada is committed to improved compatibility of its environmental protection measures with Canada's major trading partners and competitors.

It is often suggested that differences in environmental regulations between nations have an impact on competitiveness. The creation of "pollution havens" as a means of attracting investment is a subject of much discussion. There are also fears that environmental regulations, such as technical standards and specifications, import controls, and outright bans, are being used as nontariff trade barriers.

Understandably, tensions increasingly arise with respect to differences between countries in environmental regulations. It is vitally important that Canadian industry be positioned to compete in today's changing global economy and increasingly competitive markets. At the same time, Canadians demand a clean environment, and want their governments to implement effective domestic environmental policies. The need to reconcile trade and environment policies figures prominently in current discussions surrounding the General Agreement on Tariffs and Trade (GATT) as well as on the agenda of the OECD. It was also a major issue at the 1992 United Nations Con-

ference on Environment and Development.

Harmonization

Many people propose harmonization as an answer. The underlying notion is that there be no movement to a lowest common denominator of environmental protection. The growth of regional trading blocs, such as the European Community and the North American Free Trade Agreement, has led to calls for common rules among the parties. The European Community, for example, negotiated baseline standards that all member countries must meet, while at the same time allowing members to set stronger regulations unilaterally. Efforts are also underway within industry associations and standards organizations to promote harmonization through voluntary standards and codes of practice.

The work of the International Standards Organization (ISO) in the environmental field is gaining attention. The ISO 9000 series of standards on quality management is being used by international companies to demonstrate excellence. Quality standards can be guaranteed by registration or certification. Certification is a process providing third-party auditing to assess the performance of a company, a product, or an institution vis-à-vis specific quality standards or requirements. A current ISO

effort related to environmental management is being led in Canada. Standards related to labelling, auditing, performance evaluation, and management systems are expected.

International harmonization of environmental objectives, moreover, is the preferred approach of many in cases of transboundary or global environmental problems handled through international environmental agreements. These need to be results oriented, with the means to achieve the end left to the discretion of the parties involved. Yet the results must be verifiable.

There are important reasons why environmental regulation varies from country to country. The OECD has reasoned, in its Guiding Principles Concerning the International Aspects of Environmental Policies, that varying environmental regulation in countries is justified by a variety of factors. These include different ecosystem assimilative capacities, different social objectives and priorities, and different degrees of industrialization and population density.

The review found little evidence that Canadian industry's access to, and competitiveness in, international markets have been significantly affected by differences between Environment Canada's environmental protection regulations and those of its major trading partners and competitors. For the most part, industries in these countries face similar regulatory requirements. Canada and its competitors share a concern with

global environmental protection. However, much more analysis would have to be undertaken on comparative requirements and on levels and costs of compliance to come to any firm conclusions on the subject. Many factors play a role in competitiveness, and to focus on international differences in stringency of regulations can be misleading.

Differences in policy instruments used to achieve environmental objectives could make a difference in compliance costs. Policy instruments, such as economic measures and voluntary industry standards, adopted by other countries to achieve similar environmental objectives should be thoroughly studied to see if their adoption could promote competitiveness.

International Environmental Agreements

Almost half of Environment Canada's environmental protection regulations respond to commitments made under international environmental agreements.

As encouraged by the Green Plan's Global Environmental Security initiative, Environment Canada continues to pursue international environmental agreements to achieve solutions to global environmental problems. Environment Canada plays two distinct roles in relation to regulations that comply with international commitments. It negotiates and promotes the commitments and targets of international environmental agreements,

and it develops and implements national control strategies to meet the commitments and targets.

Information collected in the regulatory review has shown that, in most cases, Environment Canada consulted adequately with industry representatives and other government departments in the process of negotiation leading up to Canada's current commitments. Competitiveness considerations were given due weight in the negotiations.

However, the review suggests that more attention could be given to wider use of multi-stakeholder participation in developing Canada's

positions at international negotiations. It also encourages the development of protocols for early involvement of affected industries so that the ground rules are clear from the outset.

Many of Canada's international commitments require the use of both provincial and federal legislative authorities to deliver on the control strategies. The roles and responsibilities of the levels of government need to be clearly defined. The clearly defined involvement of provincial governments and industry in establishing Canadian international environmental commitments will make meeting targets more efficient and less costly.

Findings

- 4.1 The review found no evidence that Canadian industry's access to, and competitiveness in, international markets have been significantly affected by differences between Environment Canada's environmental protection regulations and those of its major trading partners and competitors. For the most part, industries in these countries face similar regulatory requirements.
- 4.2 More analysis needs to be undertaken on comparative environmental regulatory requirements of major trading partners to come to any firm conclusions on the subject.
- 4.3 Policy instruments, such as economic measures and voluntary industry standards, adopted in other countries to achieve similar environmental objectives should be thoroughly studied to see if their adoption could promote competitiveness.

In a federal state, cooperation between the different levels of governments is a necessity. As well, the nature of environmental issues is such that the cooperation of all interested parties is essential. Neither governments nor the private sector has the means and resources to resolve, by themselves, most major environmental issues.

In Canada, responsibility for the environment is shared. The division of powers laid out in the *Constitution Act* of 1867 makes no mention of the "environment". Jurisdiction is based on the allocation of powers in areas that lend themselves to environmental and resource management, with the result that each level of government has jurisdictional powers in environmental matters. For example, the federal government retains full responsibility for the inland and coastal fisheries, which includes responsibility for fish habitat: the provinces have constitutional responsibility for management of land and water resources. Not surprisingly, this has led to overlapping environmental responsibilities. Mandate for the environment is further divided among many departments and agencies within the different levels of governments. Such features of the Canadian federal system present difficult regulatory challenges.

Industrial smokestacks, smog over cities, soil erosion, and visible pollu-

tion of many lakes and rivers led to the introduction, in the 1960s and 1970s, of a series of environmental regulations in Canada. Different levels of government contributed to the regulatory mix; sometimes more than one level of government issued regulations to resolve the same environmental problem.

Industry expressed concerns during the federal government's 1992 Prosperity Initiative that the current approach to environmental protection is overly complicated and costly in both time and resources. In some sectors, industry has to respond to federal, provincial, territorial, and municipal government environmental regulations. It pointed out that regulatory overlap increased industry's cost for getting the same results. It contends that overlap uses up money that could be spent more productively to effect environmental protection.

Some industry sectors argue that the application of overlapping regulations is imposing unintended constraints on their ability to be competitive and on their effectiveness in responding to today's environmental challenges.

Some people also believe that differing provincial regulatory requirements constitute potential interprovincial trade barriers. Efforts are currently underway by federal, provincial, and territorial ministers responsible for internal trade to identify barriers to

the free movement of goods, services, people and capital within Canada.

No evidence was found in this review to indicate that any of Environment Canada's regulations impose internal barriers to trade. The effects of differing provincial regulatory requirements were not examined.

In its 1993 report *Sustainable Energy and Mineral Development*, the House of Commons Standing Committee on Energy, Mines and Resources noted that witness after witness spoke of the complexity, inconsistency, inefficiency, and lack of coordinated application of the existing regulatory system in these sectors. It recommended that environmental legislation and regulation be harmonized across Canada.

The House of Commons Standing Committee on Finance, in its 1993 report *Regulations and Competitiveness*, noted that progress to date to reduce areas of federal-provincial overlap has been painfully slow. It warned there is a real risk that unless harmonization efforts are intensified, the potential for regulatory conflict between the levels of government in some of the main areas of regulatory growth, such as the environment, will likely increase. The Government Response agreed with the committee report regarding overlap and encouraged departmental efforts to find and resolve such situations. The thrust of the response was on eliminating overlap and on adoption of national standards where possible.

Not all aspects of the regulatory overlap inherent in a federal system are negative. Positive effects include better accommodation of the diversity of the constituent communities, and the potential for better responses when more than one level of government brings its expertise to bear on a problem. But shared jurisdiction and regulatory overlap can increase compliance costs, create uncertainty, and fragment the domestic market, making it more difficult for businesses to operate across provincial boundaries.

Seeking Harmonization

The shared nature of environmental jurisdiction makes partnerships between the federal, provincial, and territorial governments vital to the success of environmental policies and objectives.

Environment Canada pursues harmonization of environmental protection regulations through the Canadian Council of Ministers of the Environment (CCME) and the Federal-Provincial Advisory Committee under CEPA. In 1990, the CCME adopted the Statement of Interjurisdictional Cooperation on Environmental Matters. It provides an overall framework for intergovernmental cooperation on environmental matters. It sets out the principles that will guide the formulation of formal environmental cooperative agreements between neighbouring provinces or territories, or between provinces and the federal government.

Recent attempts by Environment Canada to coordinate and harmonize its environmental protection activities with its provincial and territorial counterparts have taken two forms: delegation of administrative responsibilities by one level of government to another and intergovernmental coordination of overlapping activities. Currently, the emphasis is on the development of an approach in which industry would satisfy all environmental regulatory requirements on particular issues through one level of government – the one-window approach. Administrative agreements and equivalency agreements under CEPA and administrative agreements under the *Fisheries Act* have been under development for several years to achieve this end. To date, however, no such agreements have been signed with the provinces.

Other examples of the harmonization efforts of the CCME include the National Packaging Protocol, the National Waste Management Strategy, and the National Action Plan for Recycle, Reuse and Reclamation of Ozone-Depleting Substances, ongoing work

towards a Comprehensive Air Quality Agreement, a National Action Strategy on Global Warming, and the NOx/VOC Management Plan for low-level ozone control. These successes emphasize that an agreement on ways to resolve environmental problems is easier to reach in the early planning stages. It is difficult to come to formal agreement on changing past decisions (regulations already in place), especially where they have been cemented in action.

Throughout this review, it was stressed by numerous participants that a more simplified approach to the whole area of environmental protection is needed. New, innovative approaches to reducing overlap of federal and provincial regulations need to be pursued. The review suggests that it would be beneficial if legislation at each level of government were to emphasize distinct roles and provide the means for efficient delegation to other levels of government. The objective would be to satisfy federal and provincial constitutional responsibilities in the most effective manner.

Findings

- 5.1 Federal-provincial coordination and harmonization should be at the top of the agenda for easing the environmental regulatory burden faced by industry. New, innovative approaches need to be pursued.
- 5.2 The review points to a continuing need to simplify the current environmental protection regime in Canada. Industry and others should know exactly who does what.
- 5.3 No evidence was found in this review to indicate that any of Environment Canada's regulations impose internal barriers to trade.

This review of EP regulations has brought to light interesting opportunities for streamlining, simplification, and consolidation. Because these opportunities are partly dependent on the authorizing legislation, the eight *Fisheries Act* regulations and the 25 CEPA regulations are dealt with here separately.

In the case of the *Fisheries Act* regulations, there is a clear signal from industry that it perceives that regulatory overlap exists with provincial water quality protection regulations. In addition, the review suggests that two *Fisheries Act* regulations can be repealed.

The review also points out ways to streamline some of the 25 CEPA regulations: one regulation and half of another could be repealed, and ten other regulations could be consolidated into three. Federal-provincial overlap is also a concern with regard to some CEPA regulations.

Fisheries Act

The contribution of the fisheries resource to the Canadian economy is sizable. In 1990, Canadian commercial fish products were valued at over \$3 billion, with the Atlantic fisheries dominating at over \$2 billion, followed by the Pacific fisheries at \$875 million and the inland fisheries at \$125 million. Recreational fishing adds an even bigger slice to the value of this

resource. For example, in 1989, anglers in British Columbia alone spent about \$400 million. Overall, recreational fisheries in Canada contribute more than \$4.4 billion annually to the economy.

Canadian aboriginal peoples have traditionally depended on fishing for a substantial part of their food requirements. This lifestyle continues today in many parts of Canada, reinforcing the need to protect both coastal and inland waters from pollution that would affect fish production.

Aquaculture in Canada provides a new dimension to federal fisheries responsibilities. The growth of this industry sector has been remarkable. An eightfold increase in production value was measured between 1982 and 1988 to \$100 million. Total production is expected at least to double between 1989 and 2000, and possibly to quadruple to 120,000 tonnes per year.

This multi-billion dollar a year renewable fisheries resource is a national asset. All governments benefit from its preservation, as all governments benefit from the use of the nation's mineral wealth and the sustainable development of Canada's forests.

Constitutionally, the federal government is responsible for the fisheries resource, although administrative responsibility for management of most

inland fisheries has been delegated to the provinces. The federal government retains full accountability for keeping fish habitat conditions in a healthy state. The *Fisheries Act* is the legal instrument used to protect fish and fish habitat. Through an agreement with the Department of Fisheries and Oceans (DFO), the pollution control provisions of the *Fisheries Act* are administered by Environment Canada. As well, while retaining responsibility for fish habitat protection, DFO has delegated administrative responsibility for management of the inland fisheries to the provinces.

The provinces on the other hand have constitutional authority for management of water resources. They too must take actions to ensure that the water resource is protected and used wisely.

These related constitutional responsibilities and the delegated administrative fisheries duties necessitate the close cooperation and coordination among federal and provincial resource and environment departments that exist today.

The *Fisheries Act's* strongly worded general pollution prohibition provision prohibits the discharge of any substance deleterious to fish. It is a nonprescriptive and wide-ranging obligation. All who discharge wastes to water are governed by this general prohibition.

Some industry sectors want or need clearer rules. The Act allows the government to establish levels of

discharge of particular substances that will be considered acceptable. Other substances discharged by regulated industry sectors that are not identified in the regulations remain subject to the general prohibition.

In the early 1970s, some major industry sectors (pulp and paper, mining, petroleum, and food processing) were discharging waste to the extent that the fisheries resource was threatened and *Fisheries Act* regulations were deemed necessary to protect the resource.

At the same time, provincial governments were beginning to respond to a more vocal public that was demanding cleaner water for health, recreational, and other reasons. The actions at both levels of government were mutually beneficial. Provincial efforts to improve water quality helped to protect fish: federal action to protect fish led to better water quality.

The main complaint heard from industry during this review is not about the requirements they must meet; rather, it is about the burden of having similar federal and provincial regulations, and of having to deal with a variety of regulators, all asking for compliance data and information in a slightly different way or at different time intervals. They find dealing with more than one level of government for similar purposes to be both wasteful and irritating.

Although industry expressed concern about regulatory overlap, it did not provide sufficient detail to answer

such questions as: Is the overlap between governments (federal, provincial, and municipal)? Is it between departments at the federal level or is it between departments at the provincial level? Are the objectives and resulting effects of the overlapping regulations essentially the same, that is, are they enforced equally and are exceptions to the regulations allowed in one case but not in the other? Efforts to clarify the situation are underway through such forums as the CCME.

Industry has asked that the pollution control provisions of the *Fisheries Act* be modified to allow for equivalency agreements. This modification would permit the federal government to enter into agreements with the provinces to have federal water pollution control requirements for fisheries protection met by provincial water quality regulation and enforcement.

The review suggests that the feasibility of this request needs study. More clarity and consensus are required with regard to defining what overall needs have to be satisfied in this area, and whether equivalency agreements or other mechanisms would answer the needs. By definition, equivalency agreements would eliminate the industry/federal government interface in day-to-day compliance and enforcement activities, but may not answer all the problems and may introduce other difficulties. Differing federal, provincial, and territorial regulations and regulatory regimes will continue to project the

image of a complex Canadian environmental protection regime. Dozens of agreements would create the need for a bureaucracy to administer them. And the questions of determining true overlap and of defining adequate conditions for equivalency remain.

It may be that effort should be devoted to harmonizing the different regulatory regimes where this is a realistic possibility, rather than trying to work exclusively toward equivalency agreements.

The review indicates that it may be appropriate to revoke two *Fisheries Act* regulations governing parts of the food processing industry: the Potato Processing Plant Liquid Effluent Regulations and the Meat and Poultry Products Plant Liquid Effluent Regulations. The review found that the current provincial regulations may offer similar levels of environmental protection and could become the sole control mechanism. Should these regulations be repealed, these parts of the food processing sector would continue to be subject to the general prohibition of the *Fisheries Act*.

In the mining sector, the industry association signalled that the *Fisheries Act* regulations should be extended to cover all metal mines. At this point, 48 per cent of metal mines are subject to the regulatory requirements and the balance to federal guidelines. Industry suggests that these mines would gain from the legal certainty that the regulations provide.

A general theme from the review of *Fisheries Act* regulations is that regulatory requirements should be based on sound science. To date, much reliance has been placed on technology-based regulations.

Environmental effects monitoring is now a requirement for the pulp and paper industry; the review suggests that it should also be a requirement for the mining and petroleum sectors. From a *Fisheries Act* perspective, this makes good sense. Where the science base is inadequate, additional work, such as data collection, monitoring, and research, needs to be done to understand how pollutants affect the life cycle of fish, and to know whether a discharge is deleterious to fish.

Further development of this science base might, over the longer term, render technology-based regulations obsolete. A better understanding of the effects of pollution on fish might result in science-based regulations or standards designed to protect particular fish habitats. In some circumstances, fuller scientific understanding might be all that is needed to prove violations of the pollution control provisions of the *Fisheries Act*.

Relying on the science base would also have benefits from a competitiveness point of view, as it would give companies maximum flexibility in determining where to locate and how to control their discharges. A firm's operations may require more or less control than currently dictated by regulations, depending on the sensitivity of local fish populations.

Other water uses would also influence control requirements.

Canadian Environmental Protection Act

This Act is to be thoroughly reviewed over the coming months by the Department and a parliamentary committee; the CEPA legislative review is mandated by the legislation itself.

Of the 25 CEPA regulations reviewed, 22 are under Part II, Toxic Substances. It is in this area that opportunities for repeal, simplification, and consolidation exist. The suggested changes do not appear to raise any major policy issues. They offer enhanced clarity of communication and interpretation, improved ease of administration, and potential cost savings to industry and government.

CEPA Part II approaches protection of human health and the environment much differently from the way the *Fisheries Act* approaches protection of fish. There is no general provision prohibiting the discharge of substances harmful to human health or the environment. With CEPA Part II, nothing is harmful or toxic until it is proven to be so through an assessment process and scheduled under the Act. Only substances declared toxic may be regulated, but substances declared toxic do not have to be regulated. CEPA has emergency provisions that allow the Ministers of Environment and Health to take more immediate action with a substance that is an immediate threat.

The Act offers the opportunity for establishing equivalency agreements. The review suggests that the conditions for equivalency agreements should be less prescriptive and more results-oriented.

This review highlights some actions that can be taken to consolidate groups of existing regulations to make life simpler for the people affected by them. A few regulations ban the production, import, and use of substances. More such regulations may be required from the assessment of substances on the initial Priority Substances List under CEPA.

The development of a generic banned substances regulation to which substances would be scheduled may be administratively simpler and more efficient than separate regulations. Currently, the Polybrominated Biphenyls Regulations, Polychlorinated Terphenyls Regulations, and Mirex Regulations could be scheduled to such a regulation. The merits of such a regulation could be examined further. The Ozone-Depleting Substances Regulations Nos. 1, 2, and 4 could be amalgamated into one regulation.

For people in the import/export business, it may be simpler to have the following regulations consolidated: Export and Import of Hazardous Wastes Regulations, PCB Waste Export Regulations, Contaminated Fuel Regulations, and Toxic Substances Export Notification Regulations. An in-depth analysis of the pros and cons should be undertaken.

The PCB Waste Export Regulations warrant a close look. They were a reaction to the refusal of British dock workers to accept a shipment of waste PCBs from Canada. A decision by the CCME led to the regulations; however, concern was expressed at the time that blocking the door to all exports might not be in Canada's best interest.

Since then, the Export and Import of Hazardous Wastes Regulations have been issued. Had they been in effect at the time of the British incident, the incident probably would not have occurred, and the PCB Waste Export Regulations may not have been needed. A repeal of the regulations would mean more flexibility in the disposal options for PCBs and less regulation.

The Fuels Information Regulations No. 1 are a twofold regulatory instrument, demanding in one section information on sulphur content of fuels and in the other section information on fuel additives. The review strongly suggests that collection of information on fuel additives is irrelevant today; it is not used. If needed in the future, such information could be collected through the information-gathering powers of CEPA. Thus the additives half of this regulation should be repealed. Sulphur information collection should be studied further. It appears that this information might be successfully gathered by Statistics Canada. If so, the need for the remainder of the regulations may not exist either.

The Chlorofluorocarbon Regulations are also suggested for repeal. Developments since the Montreal Protocol on Substances that Deplete the Ozone Layer have rendered these

regulations redundant. The other ozone-depleting substances regulations and the complementary provincial regulations provide the needed protection.

Findings

- 6.1 Through CCME, a detailed comparison of federal and provincial environmental regulations could be initiated province by province to pinpoint areas where the effects of regulatory efforts are similar. Development of options to eliminate overlap would follow.
- 6.2 The feasibility of amending the *Fisheries Act* to allow for equivalency agreements with the provinces for the pollution control regulations should be examined. The objective of equivalency agreements would be to apply only one set of regulations where both federal and provincial regulations exist.
- 6.3 More effort should be devoted to understanding and monitoring the effects of industrial discharges on fish. Such work would place an additional burden on the scientific resources of the Departments of Fisheries and Oceans, and Environment.
- 6.4 Consideration should be given to revoking the Potato Processing Plant Liquid Effluent Regulations, the Meat and Poultry Products Plant Liquid Effluent Regulations, the Chlorofluorocarbon Regulations, and the additives part of the Fuels Information Regulations No. 1.
- 6.5 The review indicates that consolidation of the four regulations dealing with import and/or export could be examined; in addition, consideration should be given to grouping three ozone-depleting substances regulations into one set. As well, a "banned substances" regulation could be developed to replace three current regulations dealing with Mirex, PBBs and PCTs. This reduction of ten regulations to three could reduce burden on clients, and make administration of regulations simpler with no apparent negative environmental effects.
- 6.6 CCME should be asked to revisit the question of banning the export of PCB wastes. A regulation is now in place to ensure that importing countries consent to receiving hazardous wastes before they are shipped.

Assessing the social and economic costs and benefits of environmental initiatives is vital to decision makers. Regulatory initiatives are no exception. Cost-benefit analysis provides an essential part of the knowledge base upon which sound environmental management decisions are made. Decision makers need high-quality, timely information.

Developing regulations, ensuring their application, and complying with regulatory requirements involve a wide range of social and economic costs to the public and private sectors. Regulatory benefits – some financial, others more difficult to quantify – are the major reason for government intervention. Most often, environmental protection regulations generate primarily private costs and public benefits.

Clearly, the objective is regulations that result in positive net benefits for Canadian society at large. Appendix 4 contains current Treasury Board policy which directs that government decisions to pursue regulatory initiatives should be based on positive net benefits and require formal cost-benefit analysis for those regulatory proposals for which compliance costs will be over \$100 million.

Assessing the costs and benefits of any specific regulation continues to be a major challenge. These problems are not unique to Environment

Canada. But methodological and data limitations of benefits valuation are more acute in the environmental field. Typically, for the regulations administered by Environment Canada, the most obvious costs have been estimated in monetary terms, while the benefits have been identified and assessed qualitatively.

The costs of a proposed regulation, such as expenditures on pollution abatement equipment and adoption of alternative technologies, are usually immediate or short term. They often fall on a single industrial sector or a particular group of companies. The particular groups affected by the proposed regulation are naturally motivated to ensure that the "private costs" of the regulation are clearly identified. As a result, the private costs of a regulation are relatively easy to identify, data are usually available, and the costs can be estimated in a meaningful way.

These estimates are usually calculated monetarily and range from a total value for all affected firms or industries to more detailed estimates at the industrial subsector or facility level. The estimates are based primarily on the capital and operating expenditures required to meet the technical limits or the administrative requirements established by the regulation. Other costs, such as lost opportunity costs, are more difficult to quantify and usually are only par-

tially addressed. Likewise, competitiveness impacts are not specifically estimated.

In contrast, it is significantly more difficult to estimate or place a monetary value on the benefits of a proposed environmental regulation. Benefits are most often long term and are "public benefits," that is, they accrue to all or large segments of society. Determining benefits on a monetary basis can be difficult, especially with matters such as life, health, longevity, preservation of species, and cultural and heritage values. The commitment of sufficient time and resources to do it right is critical.

When used, the valuation of the benefits of an environmental regulatory initiative often clearly demonstrates that, while specific benefits may be small, the total value of all the benefits to all of society can be quite significant.

Even so, benefits valuation methods provide only an estimate of the value of environmental benefits; at best, they are able to value only part of the total benefits associated with a specific initiative.

The difficulties with estimating benefits are not restricted to Canada.

In the United States, for example, an Executive Order requires U.S. regulatory authorities to advance only those regulatory proposals with positive net benefits. This requirement is being reconsidered.

Since the introduction of the Regulatory Impact Analysis Statements (RIAS) in 1986,² it has been possible to assess private sector costs to varying levels of detail. The regulatory review shows that there has been good improvement in the detail and quality of the RIAS since 1986. Moreover, the RIAS process itself has been evolving. A separate competitiveness component has been a feature of Environment Canada's environmental protection RIAS only for the past two to three years. Nevertheless, all of the regulations reviewed in this document passed through a comprehensive government assessment process that was deemed appropriate at the time.

Competitiveness impacts were discussed as part of the overall cost estimates for industries and firms. Most RIAS included a qualitative assessment of the benefits of the regulation. When possible, the general statements of benefits, such as improved water quality, enhanced property values, increased recreational opportunities, and reduced exposure

²Since the introduction of RIAS for new regulations and amendments to regulations, including roll overs, RIAS have been undertaken for 26 regulations of the 33 regulations made under the *Fisheries Act* or the *Canadian Environmental Protection Act* (CEPA). Seven of Environment Canada's environmental protection regulations were issued prior to the regulatory policy requiring RIAS and, since they have not been amended, they have never been subject to the RIAS process. Of the 26 RIAS prepared, ten were for regulations rolled over to CEPA; three were for amendments to regulations; twelve were for new CEPA regulations; and one was for a new *Fisheries Act* regulation.

to a potential health risk, were supported by quantitative data.

Although cost-benefit analysis is expensive and time-consuming, the review shows its value as a decision making tool. In the cases where cost-benefit analysis was conducted, the results supported the introduction of the measure, even after taking into account significant private sector costs.

The review also demonstrates the need for a continued improvement in the assessment of the costs and benefits of regulations, and a par-

ticular need for better valuation of environmental benefits. Methodology in this field is still developing.

There is a wide range of difficult issues concerning the application of benefits valuation techniques to specific environmental problems. These include the valuation of a human life (the protection of which is a key benefit), the time horizon of environmental benefits (long-term benefits versus short-term costs), and even the use of cost-benefit analysis itself. These issues need to be examined in more detail.

Findings

- 7.1 Environment Canada should work with others to improve the methodology for estimates of the costs and benefits of regulatory initiatives. This will provide for better information in a timely way and contribute to better decision making.
- 7.2 Environment Canada should encourage the examination of issues surrounding the application of benefits valuation techniques.

A focus during the analysis phase of the review was to see how alternatives could apply to problems that had been resolved in the past through the introduction of existing regulations. Reviewers also looked at alternatives as a way to enhance environmental quality. A background document entitled "Study on Alternatives to Existing Regulations" was produced. It is available from the Regulatory Review Office upon request.

The review found that alternatives to existing environmental protection regulations are somewhat limited. This probably has much to do with the fact that there is limited Canadian experience with such alternatives. The applicability of alternatives to the type of regulations currently used will require detailed assessment and demonstration projects.

Environmental protection regulations can be divided into four general categories: bans, standards and controls, notification, and information provision. Some regulations fall into more than one category.

Bans

These regulations are designed to stop the release, importation, production, sale, export, or use of a substance or substances. A ban may come into effect immediately or at a later specified date. Market-based alternatives are not applicable when a

ban is immediate or in the near future. They can be of value when the ban is to be achieved over a number of years. The longer the term, the greater the potential for use of a market-based instrument such as tradeable permits. Information incentives, such as environmental accounting and pollution inventories, and voluntary action programs can facilitate achieving the goals of this type of regulation. The Ozone-Depleting Substances Regulations Nos. 1, 2, and 4 are seen as candidates for application of public education programs and voluntary actions by industry to be used in conjunction with the existing regulations.

Standards and Controls

These regulations are designed to specify product characteristics or to limit the discharge of substances. On the one hand, some industries, to maintain and protect markets abroad, request this type of regulation because of pressure from customers to address environmental concerns. On the other hand, these regulations provide little incentive to more rapid innovation and progress on both environmental and economic fronts. This kind of regulation lends itself to application of the broadest range of alternatives, either regulatory or non-regulatory. However, no matter the alternative chosen, it is important to note that, for water-related regulations, the general prohibition provision

of the *Fisheries Act* provides assurance that the fisheries resource can always be protected. Design and use of alternatives rest on detailed knowledge and assessment of the type of problem being addressed, the type of environmental goal to be achieved, and the characteristics of the regulated community.

Regulations that specify a release concentration limit can be considered candidates for capping the total amount of substance released to the environment, the cap to be determined by ecosystem considerations. Market-based instruments such as tradeable emission permits have been used in the United States to limit emissions from numerous stationary plants or firms that have varying emission abatement costs and strategies. A cap or ceiling was set for a geographic area and companies purchased the "rights to pollute" up to that cap. This situation facilitates trading and can encourage investment in new environmental technology.

Regulations of the standards and controls type are also candidates for the application of market-based alternatives, such as emission and effluent taxes, and user charges. Voluntary action, including consensus standards or codes of practice, is also a potential alternative.

Notification

These regulations are designed to notify the regulated community as to how a certain action is to be undertaken, and what procedures are to be

followed. They are an administrative type of regulation. This type of regulation is generally best suited to application of information incentive alternatives and voluntary action programs. Both stakeholder opinion and review team analyses indicate that the use of a standards writing organization, such as the Canadian Standards Association (CSA), might be called upon when considering alternatives for this type of regulation.

Information Provision

These regulations are designed to provide the regulator with information on a particular activity. There are only two such regulations in this review, one on fuels information and another on weather modification. The review indicates that information gathering is essential to meet related international commitments. At the same time, it shows that through coordination with other information-gathering agencies, it may be possible to meet information requirements through other means.

Table 8.1 categorizes all the regulations reviewed and indicates whether or not an alternative to a regulation, or an alternative in conjunction with a regulation, might be feasible.

Recent Experience

Environment Canada has some experience with market-based instruments. The provisions for the accelerated capital cost allowance (ACCA) under the *Income Tax Act* allow qualified companies a fast write-

TABLE 8.1 - Regulations by Category

REGULATIONS	BANS	STANDARDS/ CONTROLS	NOTIFICATION	INFORMATION PROVISION	CANDIDATE FOR ALTERNATIVES
Asbestos Mines and Mills Release Regulations		X			X
Chlor-Alkali Mercury Release Regulations		X			
Chlorobiphenyls Regulations	X				
Chlorofluorocarbon Regulations	X				
Contaminated Fuel Regulations	X				
Export and Import of Hazardous Wastes Regulations			X		
Federal Mobile PCB Treatment and Destruction Regulations		X			
Fuels Information Regulations No. 1				X	X
Gasoline Regulations	X				
Mirex Regulations	X				
Ocean Dumping Regulations	X	X			X
Ozone-Depleting Substances Regulations No. 1	X (phase out)				X
Ozone-Depleting Substances Regulations No. 2	X (phase out)				X
Ozone-Depleting Substances Regulations No. 3	X				
Ozone-Depleting Substances Regulations No. 4	X (phase out)				X
PCB Waste Export Regulations	X				
Phosphorus Concentration Regulations		X			X
Polybrominated Biphenyls Regulations	X				
Polychlorinated Terphenyls Regulations	X				
Pulp and Paper Mill Defoamer and Wood Chip Regulations	X	X			X
Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations		X			
Secondary Lead Smelter Release Regulations		X			X
Storage of PCB Material Regulations			X		
Toxic Substances Export Notification Regulations			X		
Vinyl Chloride Release Regulations		X			
Alice Arm Tailings Deposit Regulations		X			
Chlor-Alkali Mercury Liquid Effluent Regulations		X			
Meat and Poultry Products Plant Liquid Effluent Regulations		X			X
Metal Mining Liquid Effluent Regulations		X			X
Petroleum Refinery Liquid Effluent Regulations		X			X
Port Alberni Pulp and Paper Mill Effluent Regulations		X			
Potato Processing Plant Liquid Effluent Regulations		X			X
Pulp and Paper Effluent Regulations		X			
International River Improvements Regulations			X		
Weather Modification Information Regulations				X	

off of water and air pollution control equipment. The ACCA has been used in conjunction with Environment Canada's regulations to achieve environmental objectives since the early 1970s. The focus is on older, established industry. The ACCA lessens the costs associated with pollution control at older plants in Canada.

Environment Canada, with the provinces, has focused considerable attention recently on one market-based instrument in particular, marketable permit systems. Marketable rights are by no means non-regulatory, but they are designed to utilize market forces, harnessing them to achieve economic efficiencies. They can be incentives for innovative, lower-cost methods of complying with regulatory requirements.

Emission trading is being evaluated by Environment Canada and the provinces, as a means of meeting established targets for ground-level ozone in two areas of particular concern, the lower Fraser Valley of British Columbia and the Windsor-Quebec corridor. A Canadian Council of Ministers of the Environment (CCME) SO₂ Emission Trading Task Group has been established with federal and provincial membership to evaluate the use of emission trading to meet sulphur dioxide caps. Similarly, the CCME is investigating the possible use of emission trading to attain reductions in greenhouse gas emissions.

In 1992, Environment Canada released a paper on economic instruments to stimulate discussion on their use to achieve environmental objectives. In addition, the Advisory Committee on Environmental Protection³ is currently providing advice at the strategic level for use of economic instruments. Other jurisdictions in Canada also have experience with the use of market-based instruments.

Environment Canada has more experience using voluntary action approaches than market-based approaches. The development of the National Packaging Protocol in 1990, under the auspices of the CCME, is a recent example of a voluntary action initiative. The Protocol includes the Code of Preferred Packaging Practices. It enables marketers and distributors to bring about changes in packaging design, including re-use and recycling, to meet the CCME's target of reducing the amount of packaging sent to disposal in Canada by 50 per cent by the year 2000.

The potential to use ministerial orders in conjunction with voluntary approaches could provide a way to ensure that the voluntary effort would not be jeopardized by the few who may not want to participate. The forthcoming legislative review of CEPA could offer the opportunity to examine the use of ministerial orders for this purpose.

³This is an advisory body to Environment Canada and Industry, Science and Technology Canada with members from industry, labour, and ENGOs.

Findings

- 8.1 The review of existing regulations shows some potential exists for replacing them with alternatives.
- 8.2 More analytical work needs to be done to identify the cost and environmental effectiveness of alternatives in resolving environmental issues and to promote their consideration at an early stage. The use of alternatives to "command and control" regulations in resolving emerging issues appears to offer good potential.
- 8.3 Voluntary action and industry self-regulation, including certifiable conformance with ISO standards, are of growing importance to companies interested in total quality management. They offer cost and time savings to governments and companies alike. Their potential use in environmental matters should be explored further.
- 8.4 "Command and control" regulations continue to be essential, in particular when action is needed to protect from immediate serious threats to human health and the environment.

INTRODUCTION**List of Regulations**

- Metal Mining Liquid Effluent Regulations
- Alice Arm Tailings Deposit Regulations
- Asbestos Mines and Mills Release Regulations
- Secondary Lead Smelter Release Regulations

Review Team

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Review Process

Industry associations and companies affected by the regulations and environmental nongovernmental organizations known to have an interest in the regulations were invited in writing to submit information that would be useful to the review team's analysis. Individuals and groups who participated in consultations or provided written submissions are listed in Appendix A.1. A copy of the criteria being used for the review was included with the letter inviting submissions.

The review team's primary industry contacts were industry associations. However, secondary lead smelter companies, which are not represented by an association, were contacted directly, as was the company that owns the mine at Alice Arm, British Columbia, the subject of the Alice Arm Tailings Deposit Regulations.

Information was gathered from a variety of sources concerning the costs of the regulations, the effects on competitiveness, other impacts, and alternatives to the regulations.

The information was used by the review team to evaluate each regulation against criteria developed by the Departmental Regulatory Review Office.

METAL MINING LIQUID EFFLUENT REGULATIONS

(SOR/77-178, February 25, 1977)

Regulatory Profile

The Metal Mining Liquid Effluent Regulations (MMLER) were issued on February 25, 1977, under sections 33 and 34 (now sections 35 and 36) of the *Fisheries Act*. The MMLER apply to new, expanded, and re-opened mines (after 1977), but not to gold mines using the cyanidation process. The regulations apply uniformly across Canada as national baseline standards.

To protect sensitive areas, in addition to offering an immediate measure of protection to fish, the regulations may subject mines located in environmentally sensitive areas to specific controls. Also, provincial or local governments may impose requirements that are more stringent than the federal requirements. Both federal and provincial requirements apply.

Under the MMLER, the definition of a mine includes all metal mining and milling facilities, as well as associated smelters, pelletizing plants, sinter plants, refineries, acid plants, and any other similar operations where the effluent is combined with effluents from mining and milling.

In 1990, these regulations applied to 49 of the 102 nongold metal mines in Canada. Of the remaining mines, all of which began operation before 1977, 50 were covered by the Metal Mining Liquid Effluent Guidelines. Three mines, due to authorization prior to 1970, are not covered by the guidelines.

When developed, the objective of the MMLER was to ensure that all new and expanded base metal, uranium, and iron ore mines operating in Canada after February 1977 applied "best practicable technology" to limit the discharge into waters of deleterious substances such as arsenic, copper, lead, nickel, zinc, total suspended matter, and radium 226. This provided an immediate measure of protection to fish and other aquatic life.

In accordance with section 10 of the MMLER, mining operations are required to send the Minister of the Environment, within 30 days after the end of each month, a report containing information about the concentration of regulated deleterious substances in the effluents, the pH of effluent, and the volume of each undiluted effluent.

Between January 1989 and December 1992, Environment Canada carried out 144 inspections. During this period, five investigations were initiated and nine warning letters were issued.

Stakeholder Views

Recent Reviews

A multi-stakeholder workshop was held in November 1992 to identify issues that could be addressed in "updating and strengthening the MMLER." It was a broad public consultation event on these regulations and the need for amendment, and it was attended by representatives of Environment Canada; Fisheries and Oceans Canada; Natural Resources Canada; Industry Canada; Indian and Northern Affairs Canada; provincial agencies; industry; and aboriginal and environmental groups.

The workshop produced a comprehensive set of recommendations, which can be made available upon request.

Current Review

The groups that were invited to attend the November 1992 workshop were also invited to make submissions to the regulatory review. Many of the comments were similar to those made at the workshop. The following deal mostly with the comments received as a result of the regulatory review consultations.

Three submissions to the current regulatory review were received from external stakeholders. Comments were also received from officials of Environment Canada and Natural Resources Canada.

These submissions focused on duplication between federal and provincial requirements. It was felt that the duplication increases administrative costs for governments and industry, without any additional protection of the environment. Further, it was felt that a more favourable investment climate could result from simplifying the government-industry interface. It should be noted, however, that the MMLER were not in themselves seen as hindering competitiveness; they were developed in consultation with industry, and industry accepts that they should be met.

The adequacy of the current effluent quality limits in the MMLER and the analytical methods specified in the regulations were questioned by one stakeholder.

Recommendations made by stakeholders included ways to eliminate or reduce federal-provincial duplication. One such suggestion called for the enabling of equivalency provisions in the *Fisheries Act*. Stakeholders also recommended that the MMLER be extended to apply to all metal mines, including gold mines.

It was also suggested that transitional provisions or an authorization scheme should be established to authorize continued operation of existing metal mines pending implementation of a negotiated compliance schedule.

The idea of allowing companies to make the best use of funds available

for environmental purposes was put forward. The concept involves getting the best results for the money spent. Where meeting a specific regulatory limit would mean a marginal improvement in environmental quality at great expense, it was suggested that it might be preferable to invest in work that would bring greater environmental benefits at less cost even if it is not subject to regulation.

It was also suggested that providing incentives for accelerated reclamation of mine waste inventories could stimulate economic activity and decrease water pollution.

Several stakeholders expressed concern about the status of existing mines under the *Fisheries Act* (i.e., mines operating before the MMLER came into effect in 1977). Existing mines are dealt with by the Metal Mining Liquid Effluent Guidelines. Although the guidelines specify the same parameters and discharge limits as the MMLER, it was suggested that meeting the guidelines may not protect an existing mine from prosecution under section 36 of the *Fisheries Act*. This led some stakeholders to recommend that the *Fisheries Act* be reviewed to see if improvements can be made in its approach to protection of fish.

Assessment and Analysis

The MMLER still serve their intended purpose of ensuring that all new and expanded base metal, uranium, and iron ore mines operating in Canada

after February 1977 substantially limit the discharge of arsenic, copper, lead, nickel, zinc, total suspended matter, and radium 226 to protect the fisheries resource. The regulations enable the mines to operate without contravening the general pollution prohibition of the *Fisheries Act*.

The overall rate of compliance of mines with both the regulations and the guidelines was good at 87 and 81 per cent respectively, as stated in the "*Status Report on Water Pollution Control in the Canadian Metal Mining Industry (1990 and 1991)*." There is the possibility that some effluents are causing adverse environmental effects because of noncontrolled parameters. Environment Canada is in the process of reviewing all environmental effects monitoring data. It is premature to say whether the available data indicate that fish are affected.

The primary beneficiaries of these regulations are the Canadian public (through improved water quality and environmental protection) and the multi-billion dollar commercial and recreational fishing industries. It is important to note as well that mineral exports amounted to over \$20 billion in 1991.

Use of differing legislation by federal and provincial authorities has led to regulatory overlaps. Mines covered by the MMLER are also subject to provincial requirements that include, among other things, concentrations of pollutants in mine effluents. In theory, the protection of fish as addressed by the MMLER could be handled ex-

clusively by provincial governments. Constitutionally, however, protection of fish is a federal responsibility. The MMLER permit the discharge of specific constituents of mine effluents within certain limits. This provides mining companies with legal certainty that they are respecting the intent of the general provisions of the *Fisheries Act* for the substances listed as deleterious under the regulations.

One of the concerns with the *Fisheries Act* relates to the need to develop more flexibility in delivering on its pollution prevention aspects. The Act has a general prohibition against discharges of substances deleterious to fish. Mines discharge effluents containing substances that would be deleterious to fish if not controlled. Currently, the only means to permit controlled discharges of deleterious substances are federal *Fisheries Act* regulations. Mines that are not subject to federal *Fisheries Act* regulations are still subject to the general prohibition. However, there is no specific guidance, other than court decisions, on what is a violation of the general prohibition of the Act.

The regulations do not impose any barriers to industry's development and use of new pollution control technologies. There have been refinements to these technologies since the regulations were introduced, and mines have used them when it has been cost effective. Some spin-off benefits from the regulations have been realized by Canadian mining companies and consulting firms, in that foreign markets have developed

for the pollution control technologies used in Canada to comply with the MMLER.

Industry does not appear to have a significant concern about the impact or affordability of the regulations, although any inefficiencies or unnecessary costs resulting from the regulations can have a negative impact on profitability. Industry agrees with the objectives of the regulations. The association is working to ensure that all Canadian mines comply with them.

There are only limited data on the current costs to industry of compliance with the regulations. It appears that the MMLER have not imposed any unnecessary regulatory burdens on small communities or businesses.

There are no current international trade agreements to which the MMLER must conform.

The MMLER support the Green Plan goals of sustainable development. They are an important element in the government's strategy to encourage mining activity while at the same time protecting fish and fish habitat.

To eliminate federal-provincial duplication in the area of liquid effluent regulations, industry has advocated a one-window approach. One way of doing this would be to amend the *Fisheries Act* to allow for equivalency agreements, whereby the provincial requirements would be deemed to be equivalent to the federal requirements. Another alternative would be for the

federal government to conclude administrative agreements with the provinces, giving them the authority to administer the federal requirements and ensure that information required for administration and enforcement is provided to Environment Canada.

One possible alternative to the current regulations is the use of economic instruments, such as tradeable

permits, to control effluent emissions. Some in industry have also suggested that voluntary action by industry could be an effective alternative to regulation. However, an amendment of the *Fisheries Act* to avoid the impact of the general prohibition provision would be necessary before alternative approaches to controlling liquid effluent could be used.

Team Findings

1. The regulations should be retained.
2. Environment Canada should pursue a one-window approach to monitoring compliance with the regulations through equivalency and/or administrative agreements with the provinces.
3. Environmental effects monitoring data should be obtained to justify, before pursuing, substantive amendments to the regulations.
4. Consideration should be given to amending the regulations to expand their application to existing mines currently covered by the associated guidelines, to eliminate the regulatory discrepancy between existing and new mines.
5. Consideration should be given to broadening the scope of the regulations to apply them to all gold mines since treatment technology is now available.
6. Consideration should be given to the use of complementary economic or market-based instruments to encourage mines to reduce the deposition of deleterious substances beyond the limits set by the regulations.

ALICE ARM TAILINGS DEPOSIT REGULATIONS

(SOR/79-345, April 10, 1979)

Regulatory Profile

The Alice Arm Tailings Deposit Regulations (AATDR) were issued on April 10, 1979, pursuant to subsections 33 and 33.1 of the *Fisheries Act*. The objective of the regulations is to allow the owner of the Kitsault Mine, Climax Canada Ltd., to discharge, subject to conditions, mill process effluent into the waters of Alice Arm Inlet, on the northwest coast of British Columbia. Unconfined tailings disposal is prohibited under the Metal Mining Liquid Effluent Regulations, unless authorized by a site-specific regulation.

The AATDR enabled the Kitsault Mine to dispose of tailings at a reduced cost. Discharge into Alice Arm cost approximately \$25 million (1984 dollars) per year less than the alternative of land-based tailings disposal. Moreover, on the basis of extensive environmental impact studies conducted during the 1970s, it was concluded at that time, that the marine tailings disposal system was environmentally preferable to on-land disposal at that site.

The mine operated pursuant to the AATDR from April 1981 to November 1982, when it was shut down indefinitely due to a slumping world market for molybdenum. Molybdenum markets have remained depressed and the mine has not operated since that time.

The AATDR required detailed monitoring and reporting of both effluent data and environmental effects associated with the deposit of tailings into Alice Arm. These requirements continued for about two years after the mine closed in 1982.

Stakeholder Views

Two submissions from external stakeholders were received. The main comment made by the owner of the mine site was that the mining and milling infrastructure of the Kitsault Mine remains in place awaiting market improvements. The AATDR are essential to the ability of the mine to operate in the future. The other external stakeholder suggested that, since the mine closed down a number of years ago, the regulations should be revoked.

Comments were also received from two internal (i.e., federal government) stakeholders. One commented that the AATDR should be kept because they set a precedent for site-specific regulations and for underwater disposal of mine tailings. The other stakeholder felt that serious consideration should be given to revoking the regulations and examining alternative tailings disposal options if and when the mine proposes to re-open. This stakeholder does not agree that marine disposal of tailings from the Kitsault Mine is environmentally preferable to the alternatives, and feels that the subsequent assessment of environmental effects did not examine all the consequences of tailings deposition.

Assessment and Analysis

The regulations still serve their intended purpose and are not obsolete as long as there is a possibility that the mine might re-open. Ore reserves at the Kitsault Mine have been estimated to be in excess of 100 million tonnes, with an average concentration of approximately 0.19 per cent molybdenum disulphide. Climax Canada Ltd. anticipates an improvement in the market that will inevitably make the mine economically viable again. On the basis of previous production rates, Climax considers that the Kitsault Mine has a remaining mine life of at least 20 years, and that the AATDR are "essential to the ability of the Kitsault Mines to operate again in the future."

No data are available on the cost of compliance with the regulations. However, when the regulations were made in 1979, it was estimated that they would save the mine owners about \$25 million per year in tailings disposal costs relative to the cost of land disposal.

The regulations allowed the mine to open, thus benefiting the owners and the employees of the mine during its construction and operation. In addition, the Scientific Review Panel established by the Minister of Fisheries and Oceans concluded in its report of July 31, 1983, that "Marine disposal of tailings is environmentally preferable to any sort of land disposal scheme that is technically feasible" and that the regulations were "adequate for the protection of

economically important fisheries resources and Indian food fisheries in Alice Arm."

The regulations duplicate provincial requirements to the extent that the provincial permit needed for the mine to operate covered essentially the same issues as the AATDR. However, the AATDR are directed towards fisheries protection and are more stringent than the provincial requirements. In addition, under the current provisions of the *Fisheries Act*, federal effluent regulations are needed to protect the fisheries resource. There are no provisions in the Act that would allow for protection by other means (e.g., equivalency agreements or economic instruments).

The AATDR are aimed at encouraging economic activity while protecting fish. Furthermore, the regulations are consistent with approaches taken elsewhere where marine disposal of mine tailings is allowed.

When the regulations were developed, though, there was a great deal of debate about the possible impacts the mine could have on the environment. The regulations, therefore, required comprehensive testing and monitoring of environmental effects.

There is still no consensus, and some stakeholders have yet to express their views, about the environmental impacts of the deposit of tailings in Alice Arm Inlet, or what they might be if the Kitsault Mine were to resume operations and deposit tailings to the extent allowed by the AATDR. It is

not clear whether, in the ten years or so since the mine ceased operation, technology or economics have changed in a way that would make alternatives to marine disposal of tailings feasible for the Kitsault Mine,

or whether such changes are likely in the future.

There are no alternatives to the regulations at present.

Team Findings

1. Given that the owner of the Kitsault Mine has indicated that the mine could re-open once market conditions for molybdenum improve, the AATDR should be retained.
2. If and when the mine proposes to re-open, Environment Canada should consider the appropriateness of the AATDR in view of any changes in tailings disposal technology and knowledge about the environmental effects of marine tailings disposal that may have occurred since the AATDR were made.
3. Marine disposal of tailings should only be considered on a case-by-case basis, to ensure appropriate consideration of possible effects to each ecosystem proposed to be affected.

ASBESTOS MINES AND MILLS RELEASE REGULATIONS (SOR/90-341, June 14, 1990)

Regulatory Profile

The Asbestos Mines and Mills Release Regulations were promulgated on June 14, 1990, pursuant to subsection 34 of the *Canadian Environmental Protection Act*. First issued under the *Clean Air Act* in 1977, these regulations were intended as a precautionary measure, to limit the concentration of asbestos fibres in gases emitted into the ambient air at asbestos mines or mills from crushing, drying, or milling operations. The

regulations required asbestos mines and mills to install the necessary environmental control technology in order to meet the prescribed limits. Asbestos fibres are controlled to varying degrees by dust collection systems using mechanical collectors and/or baghouses.

The regulations contain provisions whereby the Minister of the Environment may request the owner or operator of a facility to submit:

- information and samples respecting the operation of the facility (release measurement reports);

- information on malfunctions and breakdowns; and
- information on air pollution control equipment.

Such requests have been made on a number of occasions. The need for requests is determined based on the nature of the source, the compliance history of the facility, and results of inspections or investigations.

In addition, the owners or operators are required to submit reports respecting malfunctions and breakdowns and any changes to the air pollution control equipment.

These regulations, which deal with environmental issues, are consistent with Canada's commitment in respect of the International Labour Organization (ILO) Convention No. 162 on Safety in the Use of Asbestos.

At present, the Canadian asbestos industry is almost completely confined to Quebec. There is one mill in Newfoundland which operates in spring, summer, and fall. The one mine in British Columbia was closed.

For asbestos mines in Quebec, inspection and monitoring programs are shared between Environment Canada and the Quebec environment department. Approximately half of the 72 regulated sources of asbestos emissions are monitored each year. Environment Canada inspectors witness half of the tests and provincial inspectors witness the other half. All sources are tested at least once

during each two-year period. Large sources are tested every year.

For some sources, a screening test method is used to determine whether a full-scale compliance test is required. This simplified method, which was approved during a cooperative study by federal, provincial, and industrial representatives, allows testing of more sources with the resources available. However, until further amendments to the regulations are made, the reference method described in the federal regulations remains the legal method.

Unannounced inspections are conducted at all sources each year. During these inspections, the condition of the control equipment and any changes to the process are noted.

During the period 1989-92, 86 inspections were carried out by Environment Canada. There were no investigations, but five warning letters and one inspector's direction were issued.

Stakeholder Views

Industry associations representing the asbestos industry in Canada were among the organizations invited to submit information to the review team.

There do not appear to be any major concerns about these regulations. Only one external stakeholder commented specifically on them. The main points raised in that submission were the need to include in the regulations the better sampling and test

reference method developed by a government-industry task force, and the need to amend the regulations to require malfunction reporting only when the malfunction results in the emission limits of the regulations are being exceeded.

Assessment and Analysis

Both government and industry are aware that asbestos, if misused, can be hazardous to health. The intended purpose of the regulations, namely, to limit the concentration of asbestos fibres in gases emitted into the ambient air at asbestos mines or mills from crushing, drying, or milling operations, is still being served by the regulations. Many international organizations (e.g., the World Health Organization, International Standards Organization, the European Community, the International Labour Organization, and the Organization for Economic Co-operation and Development) have adopted philosophies that are consistent with the controlled use approach adopted by the government of Canada.

Asbestos processing and manufacturing operations in Canada use "best available technology" for dust control. Dust control and working conditions approach the best in any industry today. No data are available on the cost to industry of compliance with the regulations.

Benefits include improved safety for workers and reduced health risk for communities close to these operations.

The federal and Quebec asbestos regulations have similar objectives. However, there is little if any duplication of effort. As mentioned earlier, the responsibilities for compliance testing and on-site inspection are shared.

The regulations are consistent with the asbestos emission controls used by Canada's major trading partners. The regulations support Canada's controlled use policy for asbestos. Moreover, the regulations are needed to help resolve the concerns involved in green consumerism issues, for example, calls for a ban on use of asbestos in favour of alternative fibres.

The regulations support the clean air objectives of the Green Plan, and the level of enforcement and compliance is adequate to promote environmental sustainability. The malfunction reporting requirements of the regulations and the inspections carried out by the two governments provide adequate monitoring of the state of the emission control equipment.

The regulated industry agrees with the objective of the regulations. The issues raised by industry relate to the test methods and malfunction reporting requirements.

The asbestos industry in Canada currently is confined largely to mines in Quebec, although it is possible mining will be undertaken again in other provinces. Federal regulations respond in part to ILO Convention No. 162 on Safety in the Use of Asbestos

and ensure uniform protection for all Canadians. They do not cover asbestos emission sources from waste dumps and tailing ponds. In addition, these regulations are needed in Newfoundland since there are no provincial regulations.

Duplication with the Quebec regulations is not a significant issue with the industry because of the work-sharing arrangements that have

been developed by this department's Quebec Regional Office and the Quebec environment department.

The use of economic instruments could be considered as a way to further control asbestos emissions. One option could be to use economic charges or credits to encourage a reduction of emissions below the regulated limits.

Team Findings

1. The regulations should be retained. They are achieving their intended objectives and contribute positively to the international competitiveness of the industry.
2. A formal equivalency agreement could be pursued with Quebec, and other provinces if appropriate, regarding a one-window approach for industry for implementation of these regulations.
3. The regulations should be amended to address concerns raised by industry during the consultations, for example, to allow the use of a screening method developed by a government-industry working group to determine when it would be necessary to require full-scale compliance testing.
4. Consideration could be given to the use of complementary economic or market-based instruments to encourage emission reductions beyond the limits set by the Asbestos Mines and Mills Release Regulations.

SECONDARY LEAD SMELTER RELEASE REGULATIONS (SOR/91-155, February 21, 1991)

Regulatory Profile

Regulations prescribing national emission standards for secondary lead

smelters were first issued in 1976 under the *Clean Air Act*. In February 1991, these regulations were revoked and replaced by the Secondary Lead Smelter Release Regulations, made pursuant to subsection 34(1) of the *Canadian Environmental Protection Act* (CEPA).

The main objective of the Secondary Lead Smelter Release Regulations is to limit the concentration of particulate matter containing lead emitted into the ambient air from defined sources within a secondary lead smelting facility. The regulations also contain provisions regarding plant malfunctions, emission testing, and reporting.

Reporting under the regulations is at the discretion of the Minister of the Environment. The regulations provide for the submission of release measurement reports (emission testing) and malfunction or breakdown reports.

The number of emission sources in Canada is approximately 100. Not all of these emission sources are tested on a prescribed basis. Most major sources are tested annually because of the nature of the source and the potential for significant releases of lead. Minor sources are inspected less often, and requests for testing and reporting are based on the information obtained during inspections. About 50 of the 100 sources are tested each year.

Plant inspections and source emission tests are used to verify compliance with the regulations. Currently, 26 facilities are subject to the regulations. Between January 1989 and December 1992, 162 inspections were carried out. Three investigations were initiated during this period. Nine warning letters and three inspector's directions for corrective action were issued.

Stakeholder Views

In the past, concerns have been raised by some industry members subject to the regulations. The key issues related to the application of the regulations and the definition of a secondary lead smelter or process, the cost of monitoring programs, and duplication of federal and provincial testing and reporting requirements. Specific concerns have been raised about the applicability of the limits specified in the regulations to sintering plants in primary lead smelters affected by the regulations.

Provincial governments have expressed concerns about the application of the regulations to small businesses and the need for a review of best available control technologies in relation to the prescribed limits. Environment Canada reviews have also raised questions about defining sources subject to the regulations, the enforceability of certain provisions within the regulations, and the need for flexibility in monitoring and reporting provisions.

Assessment and Analysis

The regulations still serve their intended purpose of limiting the concentration of particulate matter containing lead emitted into the ambient air from defined sources within secondary lead smelters. Industrial processes and technologies have not changed significantly since the regulations were made. To date, control methods in the secondary lead in

dustry have been based on baghouses, which are capable of reducing emissions by more than 99 per cent.

The estimated number of emission tests performed annually for compliance monitoring is 50, at an average cost of \$5000 per test. Therefore, the annualized cost to industry for testing and reporting of lead releases is about \$250,000. Annual expenditures for stack testing by six major Canadian secondary lead smelters have been calculated to average about \$49,000 per facility.

The economic burden associated with compliance monitoring can be disproportionate to the size of the facility being tested. Testing costs depend on the number of stacks tested. However, the number of stacks at a smelter is not necessarily related to the amount of lead processed at the facility, and some small secondary lead smelters have more stacks than larger facilities. Environment Canada is reducing the testing burden on smaller facilities by not requiring testing of all emission sources at any one time.

The regulations are achieving the intended benefits. Most regulated facilities have installed the pollution control equipment needed to comply with the regulations, and compliance monitoring tests have shown a high degree of compliance.

In general, provincial regulations have the same objectives as the Secondary Lead Smelter Release Regulations.

Some provinces have regulations that are almost identical to the federal regulations. In other provinces (e.g., Ontario), ambient concentration limits are used to ensure that lead smelters control emissions.

The environmental problems addressed by the regulations could be handled solely by provincial governments. In some cases, equivalency agreements under CEPA could be developed; in others, administrative agreements could be considered.

There is essentially a level playing field internationally with respect to regulation of lead emissions from secondary lead smelting. Canada's major trading partners have lead emission regulations that are similar to the Secondary Lead Smelter Release Regulations, although the stringency of regulations varies from country to country. For example, the regulations governing secondary lead smelters in the United States are more stringent than those in Canada. Regulations in some other countries are less stringent.

By compelling secondary lead smelters to use technology that is able to reduce lead emissions by up to 99 per cent, the regulations support the Clean Air objectives of the Green Plan and promote environmental sustainability: secondary lead smelters are able to operate with less potential adverse impact on human or environmental health.

One of the main concerns raised by some industry people is that the

definition of secondary lead smelters in the regulations may capture unintended operations. The regulations apply to the secondary lead smelters whose primary feedstock is secondary lead materials such as spent lead-acid batteries. However, they also apply to primary smelters that fall under the definition of a secondary lead smelter when including scrap materials in their feedstocks, and to businesses such as battery manufacturers and solder materials manufacturers. This broad application of the regulations, while technically or legally not in question (all these businesses are within the definition of a secondary lead smelter), does beg the question of why these sources are targeted and other sources of emissions are not.

Industry has recommended a one-window approach to controlling lead emissions. Such an approach

might take the form of administrative agreements with the provinces that would give the provinces authority to administer federal regulations, with provincial staff trained and appointed as inspectors under CEPA. Equivalency agreements under CEPA would essentially give sole responsibility to the provinces, subject to specified conditions needed to satisfy legislative requirements.

Some industry stakeholders have also suggested codes of practice under the Act and voluntary action by industry as two other means to achieve improvements in the operation, maintenance, and monitoring of existing air pollution control equipment. Economic instruments might also be used to control lead emissions, for example, economic charges or credits to encourage a reduction of emissions below the regulated limits.

Team Findings

1. The regulations should be retained.
2. Environment Canada should pursue a one-window approach with the provinces for implementation of the regulations, through equivalency and/or administrative agreements.
3. Environment Canada should clarify the scope and application of the regulations, particularly with respect to the inclusion of primary smelters with unit operations similar to those listed in the regulations. Consideration should be given to either exempting sintering plants from the regulations or setting new emission limits for them in the regulations.
4. The federal government should clarify, as soon as possible, the approach to prevention or control of lead emissions from other sources. A number of industrial sources of lead other than those covered by the regulations appear to be of similar significance but are not federally regulated.

5. A more strategic approach to compliance monitoring should be undertaken to reduce reliance on annual stack testing. Approaches such as baghouse inspections and the promotion of good maintenance practice should be considered for determining compliance at times other than an actual stack test.
6. Environment Canada should develop ways to accept electronic data reporting, where this would be more efficient than paper reporting.
7. Consideration could be given to the use of complementary economic or market-based instruments to encourage emission reductions beyond the limits set by the Secondary Lead Smelter Release Regulations.

Appendix A.1

Individuals and groups who participated in consultations or provided written submissions

External Stakeholders

Association des mines d'amiante du Québec
B.C. Ministry of the Environment
Brunswick Mining and Smelting Ltd.
Canada Metal Company Ltd.
Climax Canada Ltd.
General Motors of Canada Ltd., Oshawa Delco Remy Battery Plant
Kester Solder Company of Canada Ltd.
Metalex Products Ltd.
Mining Association of Canada
Tonolli Canada Ltd.
West Coast Environmental Law Association

Internal Stakeholders

Natural Resources Canada
Environment Canada
Health Canada
Industry Canada

INTRODUCTION**List of Regulations**

- Chlor-Alkali Mercury Liquid Effluent Regulations
- Chlor-Alkali Mercury Release Regulations
- Pulp and Paper Mill Defoamer and Wood Chip Regulations
- Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations
- Pulp and Paper Effluent Regulations
- Port Alberni Pulp and Paper Mill Effluent Regulations

Review Team

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Review Process

Industrial associations, companies, and environmental groups known to have an interest in these regulations were invited to submit information for use in the analyses by the review team. Stakeholders were asked for their views on the purpose and ad-

ministration of these regulations, whether these regulations hinder or enhance competitiveness and environmental sustainability, whether they should be amended or deleted, and whether there are more efficient ways to achieve the objectives of the regulations. Individuals and groups who participated in consultations or

provided written submissions are listed in Appendix B.1.

Stakeholders who participated in the consultations undertaken by this review are also participating in a complementary process in the accelerated reduction/elimination of toxics (ARET) multi-stakeholder program to encourage voluntary action to reduce and eliminate releases of toxic substances.

The regulations under consideration were analyzed individually with recommendations provided on a regulation-by-regulation basis. The extent of stakeholder consultation was tailored to each regulation.

CHLOR-ALKALI MERCURY LIQUID EFFLUENT REGULATIONS

(CRC, 1978, Vol. VII, c. 811, July 12, 1977)

Regulatory Profile

Chlor-alkali manufacturing plants employing mercury-cell technology are major users of elemental mercury. In Canada, only two mercury-cell plants remain: one in Cornwall, Ontario, and the other in Dalhousie, New Brunswick. Both are owned by ICI Canada Inc., Forest Products Division.

Regulations governing deleterious substances in liquid effluent from chlor-alkali plants were issued under the *Fisheries Act* in March 1972 and revised in July 1977. Federal government investigations found high levels of mercury contamination in freshwater fish, lakes, and rivers. The

mercury contamination negatively affected the fishing and tourist industries. However, the primary concern was, and remains, the health of those dependent on fish from watercourses receiving effluent containing mercury.

The reporting requirements of the regulations have not changed since 1977. Owners or operators of mercury-cell chlor-alkali plants are required to submit daily and monthly data. For determining the mercury concentration in a composite sample of effluent, the regulations specify the use of a reference analytical method, as well as recognized sample handling and preparation procedures. Other methods of analysis and sample preparation may be used, provided they are equivalent to the specified methods and approved by the Minister of the Environment.

These regulations meet domestic and international environmental quality objectives, but they were not developed to meet any existing international obligation.

The report of the St. Lawrence Remedial Action Plan (SLRAP) includes a study showing that the concentration of mercury in sediments downstream from ICI Cornwall Works (then CIL) decreased over the study period (1970-85). The Cornwall plant meets the existing federal regulations and is contributing to the objectives of the SLRAP. No comparable studies for the Dalhousie area were available to the review team.

Between 1970 and 1992, the number of mercury-cell chlor-alkali plants operating in Canada decreased from 15 to 2. Most plants converted to nonmercury-based processes because of public concern over the effects on human health of unnaturally high levels of mercury in surface waters and aquatic life, and because of the increased cost of electricity.

Environment Canada inspects each plant at least once a year. Monthly effluent data provided by ICI are reviewed, and appropriate follow-up action is taken if any violations of the effluent regulations are noted.

Stakeholder Views

During this review, ICI stated that the Chlor-Alkali Mercury Liquid Effluent Regulations currently serve their intended purpose, and that consideration should be given to a specific mercury regulation directed at all sources of mercury emissions and releases. At this time, the major concern of the plant operators is the uncoordinated reporting requirements of federal and provincial governments.

All parties consulted acknowledged that the regulations had resulted in the reduction of mercury levels in the waters receiving effluent from the two ICI plants – the plants have a good compliance record.

Both ICI and the Société pour vaincre la pollution (SVP) advocated the development of new federal regulations for mercury from all industrial processes and nonpoint sources.

Assessment and Analysis

The regulations meet the objectives of the *Fisheries Act*, to protect fish, fish habitat, and human use of fish. Studies for the SLRAP show that mercury levels in walleye in the St. Lawrence have declined since 1970. The SLRAP report links the decline to the reduction in mercury released to surface water since the federal Chlor-Alkali Mercury Liquid Effluent Regulations came into effect. It is important to note that the ICI plant was not the only plant discharging mercury into the St. Lawrence River in the Cornwall area during the study period, 1970-85.

In 1992, ICI Cornwall Works released an average of 23 grams of mercury per day into the St. Lawrence River. This is 8 per cent of the amount allowed under current federal regulations. ICI Dalhousie Works released an average of 11 grams per day into Chaleur Bay, representing 5 per cent of the allowable limit.

The benefits of the regulations are most obvious to parties that in any way use the watercourses to which these chlor-alkali plants release effluent, and to parties that depend on the fishery resource in these watercourses. The regulations generate benefits to society, promote pollution prevention, protect human health, and support recreational and commercial fishing. The immediate beneficiaries of the regulations in the Cornwall area, adjacent areas, and others in the contiguous St. Lawrence are those involved in sport and com-

mercial fishing and the tourist industry.

ICI's cost of compliance for its two chlor-alkali plants includes the cost of effluent treatment (mercury precipitation, sand filtration, and activated carbon), sludge treatment and disposal, and monitoring and testing. Environment Canada and ICI have independently estimated these costs to be \$400,000 per year for the two plants.

These regulations, promulgated in 1972, were based on "best available technology" (BAT) and the scientific knowledge available at that time. The regulations neither prescribe how the regulatory objective is to be met, nor

impose limits on the development of new products.

Alternatives that were considered included market instruments, BAT requirements, and self-regulation. Among the options considered for recommendation were: declare regulations obsolete; transfer enforcement responsibility; amend regulations; retain regulations; and replace these regulations with one general regulation for chemical mercury from industrial and nonpoint sources. The ARET multi-stakeholder committee has recommended a complementary initiative, proposing the elimination of the use of mercury by the chlor-alkali sector by the year 2010, or earlier.

Team Findings

1. The regulations should be retained as long as there are mercury-cell plants operating in Canada.
2. Environment Canada should encourage the public electric utilities in Ontario and New Brunswick to develop a proposal to encourage these plants to adopt the energy-saving technology already in use in the nonmercury-based chlor-alkali plants in Canada. The utilities could promote the competitive advantages of lower costs and increased productivity of the alternative technologies.
3. Environment Canada should support Ontario's initiatives designed to introduce a phase-out of mercury use.
4. The federal government should initiate discussions with key stakeholders on measures to control mercury from other industrial and nonpoint sources. The chlor-alkali sector contributes less than 2 per cent of total Canadian mercury releases.

CHLOR-ALKALI MERCURY RELEASE REGULATIONS

(SOR/90-130, February 15, 1990)

Regulatory Profile

Mercury-cell chlor-alkali plants are major users of elemental mercury. In Canada, only two mercury-cell plants operate: one in Cornwall, Ontario, and the other in Dalhousie, New Brunswick. Both are owned by ICI Canada Inc., Forest Products Division.

The Chlor-Alkali Mercury National Emission Standards Regulations were promulgated in 1977 under the *Clean Air Act*. With the inception of the *Canadian Environmental Protection Act* (CEPA) in 1988, the provisions and release limits of the above regulations were incorporated unchanged into CEPA and issued in February 1990 in *Canada Gazette* as the Chlor-Alkali Mercury Release Regulations.

The regulations require that the owner or operator of the regulated plant collect and analyze samples of gas streams released by the plant to the ambient air. The plant operators are required to test emissions from the cell rooms, hydrogen filters, retorts, and end boxes on a quarterly basis. These samples form the basis for an analysis of the mercury contained in the gas streams. The owner or operator of the plant submits the test reports at three-month intervals.

The release regulations meet domestic and international environmental quality objectives, but they were not

developed to meet a specific international requirement.

Environment Canada inspectors conduct site visits and witness emission testing conducted by the facilities. Inspectors also review and audit the quarterly emission test data submitted by the plants for any emission exceedances.

Stakeholder Views

During this review, ICI stated that the Chlor-Alkali Mercury Release Regulations currently serve their intended purpose for these two plants, but that consideration should be given to a specific mercury regulation directed at all sources of mercury emissions and releases.

The major concern of the plant operators is the uncoordinated reporting requirements of federal and provincial governments.

The views of the Société pour vaincre la pollution (SVP) were different: the regulations have resulted in a significant decrease in the release of mercury to the environment; however, SVP maintains that the airborne release of mercury from the two plants should be studied. Both ICI and SVP advocated the development of new federal regulations for mercury from all industrial processes and non-point sources.

Assessment and Analysis

Only two mercury-cell plants are left in Canada, and the regulations

governing them are well defined and effective. Market forces will determine the supply and demand for chlorine and thus the fate of the two plants. These two plants are estimated to contribute less than 2 per cent of total mercury releases in Canada.

ICI's cost of compliance for the two plants includes the cost of installing and maintaining the air pumps, sampling equipment and associated hardware, and the cost of technician's time for the quarterly testing. These costs are estimated to be \$110,000 per year for the two plants.

The regulations provide benefits to the local ecosystems by limiting the introduction of mercury into the atmospheric environment. The regulations generate benefits to society, promote pollution prevention, protect human health, and support recreational, commercial, and sport fishing.

The two ICI plants are successfully competing in the marketplace against U.S. chlor-alkali producers. In its submission to this review, ICI stated

that "the current regulations do not hinder the competitiveness of the two ICI plants with the U.S. counterparts."

When promulgated in 1977, these regulations were based on "best available technology" and the scientific knowledge available at that time. The regulations neither prescribe how the regulatory objective is to be met, nor impose limits on the development of new products.

Alternatives that were considered included market instruments, emission controls, and self-regulation. Among the options considered were: declare regulations obsolete; transfer enforcement responsibility; amend regulations; retain regulations; and replace the regulations with one general regulation for chemical mercury from industrial and nonpoint sources. The accelerated reduction\elimination of toxics (ARET) multi-stakeholder committee has recommended a complementary initiative, proposing the elimination of the use of mercury by the chlor-alkali sector by the year 2010 or earlier.

Team Findings

1. The regulations should be retained as long as there are mercury-cell plants operating in Canada.
2. Environment Canada should encourage the public electric utilities in Ontario and New Brunswick to develop a proposal to encourage these plants to adopt the energy-saving technology already in use in the nonmercury-based chlor-alkali plants in Canada. The utilities could promote the competitive advantages of lower costs and increased productivity of the alternative technologies.

3. Environment Canada should support Ontario's initiatives designed to introduce a phase-out of mercury use.
4. The federal government should initiate discussions with key stakeholders on measures to control mercury from other industrial and nonpoint sources. The chlor-alkali sector contributes less than 2 per cent of total Canadian mercury releases.

PULP AND PAPER MILL DEFOAMER AND WOOD CHIP REGULATIONS (SOR/90-268, May 7, 1992)

Regulatory Profile

Pulp and paper mills with a chlorine bleaching process use defoamer additives made from oils and polymers that could contain dibenzoparadioxins (DBDs) and dibenzofurans (DBFs). These can react in the chlorine bleaching process to form dioxins and furans in the mills' products and effluent. Polychlorinated phenols (PCPs), which are used as fungicides to preserve and protect wood, contain dioxins and furans as by-products. When chips from PCP-treated wood are used by any pulp and paper mill, dioxins and furans could be released in both the final products and the effluent.

Since the introduction of the regulations under the *Canadian Environmental Protection Act* in May 1992, the makers of defoamers have reported a dramatic increase in demand for non-oil-based defoamers and oil-based defoamers with nondetectable levels of DBDs and DBFs.

These regulations limit the levels of DBDs and DBFs to 10 and 40 parts per billion, respectively, in defoamers manufactured, sold, or used in Canada for mills using a chlorine bleaching process. The regulations also ban the use of wood chips made of PCP-treated wood in any pulp and paper mill in Canada.

Manufacturers, importers, and vendors of defoamers must submit quarterly reports for every batch of defoamer sent to mills. The reports must include the batch number, quantity of defoamer, and concentrations of DBDs and DBFs.

The pulp and paper mills using a chlorine bleaching process, as users of defoamers, must also submit a quarterly report. For every batch of defoamer, operators must report the batch number, quantity, name of the manufacturer, importer, or vendor, and they must submit a copy of the documentation indicating that the defoamer meets the regulation standards.

The regulations also set out simplified reporting requirements for manufac-

turers, importers, vendors, and mill operators or users. The simplified requirements allow for abbreviated quarterly reports. If the manufacturer, importer, vendor, or mill operator has been in compliance in four consecutive quarters, the reports need only include the concentrations of DBDs and DBFs in each type of defoamer. For wood chips, there are no reporting requirement provisions; however, mills must keep records of the purchase of wood chips treated with polychlorinated phenols.

The regulations are not required in order to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding.

Stakeholder Views

The review team met with stakeholders and received written submissions. Stakeholders included environmental groups, suppliers of oil used for the manufacturing of defoamers, manufacturers of defoamers, the Canadian Pulp and Paper Association (CPPA), and relevant government agencies and departments.

Industry perceives the control of toxic substances as a commendable goal. One manufacturer stated that the regulations are moderately outdated, since the use of recycled oils in defoamers has decreased sharply in the last several years. Historically, defoamers consisting of recycled oils contained very high levels of DBDs and DBFs.

The CPPA stated that sawmills are not using PCPs for anti-sapstain. Consequently, sawmill chips do not contain PCPs and, therefore, the records that are required for that aspect of the regulations are an unnecessary administrative burden.

One manufacturer stated that the expense and frequency of testing required by the regulations hinder Canada's competitiveness. Petro-Canada stated that the regulations increased awareness of the potential impact of defoamers with high concentrations of DBDs and DBFs. The regulations were seen to neither hinder nor enhance Petro-Canada's competitiveness.

All stakeholders agreed that as the regulations were being developed, the demand for cleaner oil was being driven by pulp and paper mills' requests for clean defoamers.

The CPPA stated that Environment Canada should eliminate the Pulp and Paper Mill Defoamer and Wood Chip Regulations because they result in an unnecessary administrative burden on the pulp and paper industry without providing additional environmental protection beyond that already achieved with the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations. The industry has accepted a standard for defoamers and is, for all intents and purposes, working to a code of practice by not accepting any PCP-treated wood chips.

Assessment and Analysis

Manufacturers of defoamers are required to analyze each batch before selling it to pulp and paper mills that use a chlorine bleaching process. This ensures that the regulatory limits for DBDs and DBFs are observed. These analyses and administrative costs are expected to total about \$180,000 per year for all the manufacturers. This figure represents the maximum cost. The actual cost could be substantially less, since the regulations include a provision by which the submission of information on the analysis of these chemicals can be reduced to once a quarter for each type of defoamer if the previous year's results show that the regulatory requirements have been fulfilled.

However, the incremental compliance costs caused by the regulations may be even lower because the pulp and paper industry had requested most of these practices before the introduction of the regulations. Compliance costs include the increased cost of raw material, the cost of modifying processes, and the cost of paper work and testing.

The regulations benefit:

- human health;
- users of watercourses (commercial and recreational);
- fish and fish habitat;
- municipalities;
- the ecosystem; and
- the Canadian defoamer makers who are now using enhanced

quality management and are in a position to seek out new markets with an environmentally friendly product.

The regulations do not impose barriers or disincentives to industry's development of new technologies, products, services, and markets. The regulations specify the maximum concentrations of DBDs and DBFs in a defoamer sold to pulp and paper mills using chlorine bleaching.

The regulations have encouraged research. Since the regulations were developed, many defoamer manufacturers have reformulated from oil-based products to silicon- or water-based products, and pulp and paper mills have almost eliminated the use of treated wood chips in their processes. The environmental threat of oil-based defoamers and treated wood chips has been substantially reduced. The replacement of this regulation by a national standard for defoamers used by the industry and the adoption of a code of practice to ban the use of PCP-treated wood chips appear to be very practical alternatives.

The regulations do not discriminate between domestic and imported products and do not impede Canadian or foreign investment in Canadian industry. Nor do the regulations impose internal barriers to trade and investment.

The alternative options considered were: retain the regulations as an instrument to protect the environment

and human health from the threat posed by dioxins and furans; retain the regulations and publish a fact sheet with clarifications; retain the regulations and introduce a national certification program; revoke the regulations when all the pulp and paper mills using a chlorine bleaching process comply with the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations; and replace the regulations with a national standard for defoamers used by the industry and a code of practice for the ban of PCP-treated wood chips.

Information provided to this review team by the major manufacturers and users of defoamers indicates a very positive trend by the industry away from contaminated defoamers now

that the pulp and paper industry is regulated under the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations.

The regulations will be a safeguard rather than a control measure within two to three years because the users, importers, and makers of defoamers are moving quickly toward defoamers with nondetectable levels of DBDs and DBFs.

Any defoamer with nondetectable levels of DBDs and DBFs is not subject to these regulations. Thus, the reporting burden and compliance costs will disappear as the consumer – the pulp and paper mill – demands an environmentally friendly product.

Team Findings

1. The regulations should be retained as an instrument to protect the environment and human health from the threat posed by dioxins and furans.
2. Environment Canada should initiate discussions with industry to develop a national standard and certification program for defoamers, and a code of practice for the use of PCP-treated wood chips through industry-supported groups such as the Canadian General Standards Board or the Canadian Standards Association.

PULP AND PAPER MILL EFFLUENT CHLORINATED DIOXINS AND FURANS REGULATIONS (SOR/92-267, May 7, 1992)

Regulatory Profile

Environment Canada and Health Canada determined that dioxins and

furans are toxic substances as defined under CEPA and are capable of harming the environment and human health. A summary of the assessment report was published in Part I of the *Canada Gazette* on March 17, 1990. In the summary, the Ministers of these departments announced they would recommend to the Governor

General in Council that the substances be added to the List of Toxic Substances in Schedule I of CEPA, and the release of these substances from pulp and paper mills be regulated.

On May 7, 1992, under section 34 of CEPA, the government introduced the Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations. The regulations are designed to protect the environment and humans from dioxin and furan releases. Owners of mills using chlorine bleaching must take measures to prevent the formation of dioxins and furans. Discharging measurable concentrations of dioxins and furans in the final effluent are prohibited.

The prohibition on releases of dioxins and furans has been in effect since July 1, 1992. In the case of many of the existing mills, significant modifications to the bleaching processes were necessary to avoid dioxin and furan formation. Sufficient time is necessary in order to implement these changes. In recognition of this, the regulations include provisions for mills built prior to June 1, 1990, to submit to the Minister a plan and schedule for the implementation of the necessary measures to achieve compliance. Mills were required to submit these within 60 days of the registration date of the regulations (May 7, 1992). On submission of the information, eligible mills were given until January 1, 1994, to comply with the prohibition of discharges.

The regulations require mill operators to collect composite samples of their final effluent and report on concentrations of dioxins and furans. The frequency of sampling is set as quarterly between July 1, 1992, and December 31, 1993, and monthly commencing January 1, 1994. In 1995, a mill may adopt quarterly sampling if it has had no measurable concentrations in its last three consecutive monthly samples. A mill may adopt annual sampling if it has had no measurable concentrations in its last three consecutive quarterly samples. The regulations require that a mill revert back to monthly testing if either a quarterly test or an annual test detects dioxins or furans. This graduated testing schedule was adopted because testing for dioxins and furans is complex and costly compared with testing for conventional pollutants.

Stakeholder Views

All parties consulted during this review supported the objectives of the regulations. The Canadian Pulp and Paper Association expressed some concern that the quality assurance/quality control (QA/QC) requirements that must be met by all mills with respect to sampling did not take into account the QA/QC history of monthly samples taken by some mills prior to the promulgation of the regulations and before the QA/QC requirements had been specified. It requested relaxation of QA/QC requirements for these mills.

Assessment and Analysis

The regulations support Canada's commitments under the Great Lakes Water Quality Agreement. No international requirements have been established for dioxin releases to the environment. There is, however, general recognition that measures should be taken to prevent its formation and thereby ensure its absence in products and effluent. Purchasers worldwide often insist on dioxin- and furan-free products.

Reducing the release of pollutants will improve water quality, which in turn will give rise to a variety of benefits. Although the benefits of these regulations are significant, they are difficult to quantify because insufficient information is available to estimate the impact on commercial, aboriginal, and sport fishing and other activities.

These benefits include:

- an improvement in the commercial and aboriginal fisheries, as well as in recreational activities;
- an increase in the value of properties located close to affected watercourses;
- a reduction in the costs of restoring polluted watercourses;
- a reduction in potential health risks;
- a general improvement in ecosystem quality; and

- better environmental conditions for future generations.

In addition, the Canadian industry as a whole will benefit because the integrity of its products is known worldwide. Mills in different parts of the country benefit as a result of the federal regulations, which ensure a national baseline for all mill operations.

These regulations were promulgated in May 1992, and not all the mills have yet had time to complete the necessary technological changes. Time is also required for the ecosystems to fully respond to the improvement. It is expected that benefits will be derived over a number of years.

To comply with the regulations, industry is modifying the bleaching processes and improving pulping processes in each mill. These steps will reduce the demand for bleaching chemicals.

These changes will result in a total investment of approximately \$568 million (1990 dollars) by the industry, spread over the 47 mills that are in operation. The mills will have to alter the mix of the bleaching chemicals used to produce pulp. Significant amounts of chlorine will be replaced by alternative chemicals, such as chlorine dioxide, to prevent dioxin and furan formation. The direct operating costs for this change are modest, at about \$3 per tonne of pulp produced.

The regulations place requirements on the quality of the effluent that is released from the mill. Industry is allowed flexibility to choose which technology it installs to meet the requirements. The regulations are not viewed as a barrier to development. The regulations are scientifically based and are equivalent to those imposed by other exemplary pulp and paper producing countries. A mill's compliance with the regulations demonstrates sound environmental stewardship and addresses concerns of consumers regarding environmental integrity.

In evaluating the degree of environmental sustainability provided by the

regulations, it is important to view them as part of a broader regulatory strategy implemented by government. The regulations are a companion to the Defoamer and Wood Chip Regulations under CEPA, and to regulations under the *Fisheries Act* to address acute lethality and conventional pollutants such as total suspended solids and biochemical oxygen demand. The *Fisheries Act* regulations also specify that mills must monitor the environmental effects of their operations. This will aid in the assessment to be made of the adequacy of the regulations.

Team Findings

1. The regulations should be retained and no changes considered at this time.
2. In view of the comments provided by the Canadian Pulp and Paper Association, it is suggested that Environment Canada meet with affected mill operators to assess the adequacy of QA/QC data relating to historic samples. The objective of the sessions would be to establish the quality of the data and to determine if it is sufficient to qualify the mill for accelerated sampling.

PULP AND PAPER EFFLUENT REGULATIONS

(SOR/92-269, May 7, 1992)

Regulatory Profile

The Pulp and Paper Effluent Regulations, passed in May 1992 pursuant to the *Fisheries Act*, amend earlier regulations passed in 1971. These regulations provide for the establishment of maximum permissible rates of release for biochemical oxygen

demand (BOD) and total suspended solids (TSS) on a daily and monthly average basis. These rates are based on a mill's reference production rates and the maximum daily and monthly release limits, per unit of production, as specified in the regulations. In addition, mills are prohibited from releasing effluent that is acutely lethal to fish. The regulations apply to pulp and paper mills that release effluent directly into receiving waters and/or to off-site treatment facilities.

Currently, 145 mills and two off-site treatment facilities are affected.

The effluent quality requirements of the regulations became effective on December 1, 1992, and include provisions for Transitional Authorization (TA). TAs allow mills to release controlled amounts of substances in the effluent while they are designing and installing pollution control facilities required to meet the more stringent requirements of the amended regulations. TAs are issued by Environment Canada according to a detailed assessment of a mill's abatement plan and may include interim release limits for BOD, TSS, and acutely lethal effluent. The TAs are valid up to December 31, 1993. Further extensions may be granted up to December 31, 1995, with the approval of the Ministers of Environment Canada and Fisheries and Oceans Canada if they are satisfied that extraordinary circumstances prevent a mill from completing its abatement program by December 31, 1993. A condition of granting a TA is that the mill must provide quarterly progress reports on the construction of its abatement facilities.

In addition to the general reporting provisions, mills were required to submit by August 31, 1992, an Emergency Response Plan describing planned procedures to prevent or mitigate the deposit of any deleterious substance during the normal course of events. This requirement was included to ensure that preventive plans are in place to avoid or minimize environmental damage. As of 1993,

the regulations also require that mills file updated Emergency Response Plans, including reports on all actions taken in the previous year, by January 31 of each year.

The regulations require mills and affected off-site facilities to conduct Environmental Effects Monitoring (EEM) studies on the receiving environment at three-year intervals. These studies address the adequacy of the regulatory framework by monitoring the effects of the release of effluent. If a receiving water is found to be particularly sensitive, more stringent, site-specific regulations could be developed to address the circumstances. EEM provides a means to ensure proper controls at all release locations.

The regulations were not issued to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding.

Stakeholder Views

Representatives of industry and environmental groups were invited to comment on the regulations. Written briefs were submitted by the Canadian Pulp and Paper Association (CPPA), two pulp and paper mills, and three environmental groups.

The CPPA, which represents about 90 per cent of the mills in operation in Canada, has expressed its support for the regulatory review. Eight recommendations related to improving the

Pulp and Paper Effluent Regulations were put forward by industry:

- Eliminate duplication of effort by federal and provincial governments and address the need for industry to report to only one level of government.
- Amend the regulations so that the requirement of section 11(3) for the submission of an updated Emergency Response Plan is eliminated and does not duplicate section 36(2) of the regulations.
- Amend the regulations so that mills can provide effluent monitoring data on a quarterly rather than a monthly basis.
- Amend the regulations to eliminate the requirement in section 26 for mills to complete quarterly progress reports on the construction of facilities and the implementation of procedures to ensure compliance with the regulations, as required in Transitional Authorizations.
- Environment Canada should grant ministerial confirmation of extensions to Transitional Authorizations to mill operators in a timely fashion.
- Environment Canada should more quickly accept Emergency Response Plans submitted by mills.
- One timetable for completion of the Environmental Effects Monitor-

ing program should be fully defined as soon as possible.

- Two mills that operate on tidal waters with a large dilution capacity recommended that the emission limits for mills should be based on local, site-specific criteria, rather than on current technology.

Comments were also solicited from three environmental groups – a national organization and two regional groups representing constituents in eastern and western Canada. The short time available precluded the preparation of extensive briefs. The view of an Ottawa-based group was that the regulations should be used to establish minimum requirements, with options for more stringent provincial regulations. Enforcement and monitoring should be integrated at the federal and provincial levels to avoid overlap.

The other environmental groups noted that the regulations do not address problems at all sites. They believe that measures need to be included to address site-specific problems and to allow for change and refinement when more is known about low-molecular-weight toxic substances in the environment. It was also stated that monitoring data need to be readily available.

Assessment and Analysis

Reducing the release of pollutants will improve water quality, which in turn

will give rise to a variety of economic benefits. Although the benefits of these regulations are significant, they are difficult to quantify. They include:

- an improvement in the commercial, aboriginal, and sport fisheries;
- an increase in the value of properties located close to affected watercourses;
- a reduction in the costs of restoring polluted watercourses;
- a reduction in potential health risks; and
- a general improvement in ecosystem quality.

The Canadian industry as a whole will benefit because the integrity of its products is known worldwide. The possibility of boycotts of Canadian products will be reduced as a result of these regulations. Mills in different provinces benefit from the federal regulations because they ensure a national baseline for mill operations. National regulations prevent "pollution havens", which may occur if some provinces regulate mills while others do not or if mills are unevenly regulated across a province.

The industry has not yet fully implemented the technological improvements, and time is also required for biological systems to adapt fully to the changes. It is expected that the benefits will be derived over the long term.

Compliance with the regulations has required large amounts of capital investment. It is estimated that the 97 plants that did not meet the effluent quality requirements at the time the regulations were promulgated will have to invest a total of \$2.27 billion. In addition to capital costs, the 97 affected plants will also incur annual operating costs totalling \$211 million. As well, the industry will face annual costs in the order of \$9 million for the provision of information relating to effluent discharges, environmental effects monitoring, and miscellaneous information.

The regulations establish requirements on the quality of the effluent that is released from plants. Industry is free to choose which technology it installs to meet these requirements. The regulations are in concert with those employed in other countries that have applied state-of-the-art legislative environmental requirements. The regulations do not impose barriers or disincentives to industry's development and use of new technologies, products, or services, nor do they create uncertainty regarding product and clean-up liability.

In evaluating the degree of environmental sustainability provided by the regulations, it is important to view them as part of a broad regulatory strategy implemented by government. This strategy consists of regulations under the *Fisheries Act* to address acute lethality and conventional pollutants (TSS and BOD) as well as two

regulations under CEPA to prevent the formation of chlorinated dioxins and furans. The latter regulations apply to all mills that use chlorine bleaching.

In order to ensure that mill operations do not impair environmental sustainability, the regulations include provision for an Environmental Effects Monitoring (EEM) program. EEM provides a means to assess the impact of releases on the receiving environment. In cases where the EEM program detects damage due to releases, more stringent, site-specific regulations can be developed.

Possible alternatives to the regulations that have been suggested are:

- developing specific regulations for individual mills based on maintaining specific water quality objectives in the receiving environment;
- using market instruments such as a monetary charge per unit of pollutant released;
- issuing tradeable emission permits;
- introducing an industry code of practice or other measures to encourage voluntary compliance; and
- removing federal regulations and relying on provincial regulations.

Team Findings

1. The current regulations should be retained.
2. Administrative agreements should be developed and signed as soon as possible by the federal government and the nine provinces that have pulp and paper mills.
3. The documentation necessary for the establishment and operation of the Environmental Effects Monitoring program should be developed as soon as possible.

PORT ALBERNI PULP AND PAPER MILL EFFLUENT REGULATIONS (SOR/92-638, November 12, 1992)

Regulatory Profile

In May 1992, the federal government promulgated regulations under the *Fisheries Act* to control the release of pollutants from pulp and paper mills.

These included general limits that are applicable to all mills. The regulations recognized that there may be cases where more stringent limits would be required to protect sensitive ecosystems.

The Port Alberni Pulp and Paper Mill Effluent Regulations prescribe more stringent rates of release for BOD and

suspended solids than allowed under the Pulp and Paper Effluent Regulations. They also require that the effluent not be acutely lethal to fish. The regulations were issued under the *Fisheries Act*.

Stakeholder Views

The regulations were developed following consultations that took place from 1989 through 1992 with the province of British Columbia, MacMillan Bloedel, and other stakeholders. The regulations were developed in parallel to the development of the National Pulp and Paper Regulatory Package.

These regulations are not required to meet any international treaty obligations, and no other federal legislation duplicates them.

To obtain stakeholder input for this review, officials of MacMillan Bloedel and two environmental groups were invited to submit comments. MacMillan Bloedel suggested that in order to improve the development of future regulations:

- all regulations should be subject to a rigorous risk analysis;
- a detailed cost-benefit study should be undertaken;
- reasonable time should be permitted to facilitate compliance; and
- there should be no federal-provincial rivalry in trying to set the strictest standards.

Assessment and Analysis

These regulations focus on improving the water quality of Alberni Inlet, which in turn will provide many types of benefits.

The value of the commercial fishing industry in the Port Alberni region was approximately \$18 million in 1991. The value of the aboriginal fishing industry, not including cultural and societal values, was \$1 million in 1991. The value to Canada of the tidal sports fishery was estimated at \$7 to \$10 million in 1991, and the freshwater fishery was estimated at \$2 to \$3 million in 1991. Consequently, the total direct value of the fishing industry in this region is between \$28 and \$32 million per year.

These regulations will likely improve water quality and thus aquatic habitat regeneration, thereby increasing fish stocks. This will have a positive impact on the regional fishing and tourist industries. As a result, additional employment and income could be generated in the region. Another direct benefit of the regulations is a reduction in the risk of an environmental disaster that could precipitate the decline of the fishing industry.

These regulations will also improve the integrity of the ecosystem.

In order to comply with these regulations, MacMillan Bloedel has had to upgrade its effluent treatment facilities. It has also reduced its output of kraft pulp in response to market conditions and the need to

meet more stringent limits. MacMillan Bloedel estimates that upgrading its treatment facilities will cost \$77 million. Environment Canada estimates the annual operating costs at \$3.7 million per year.

The Port Alberni mill is required to carry out Environmental Effects Monitoring (EEM) studies to assess the effectiveness of the regulations. The mill will also have to comply with sampling, monitoring, analytical, and reporting requirements. These expenses are estimated by Environment Canada at approximately \$230,000 for the first year and \$130,000 for subsequent years.

The regulations place requirements on the quality of the effluent. The company is allowed flexibility to choose the technology it installs to meet these requirements.

Investors are aware of the regulations that apply to this site. The regulations provide them with a stable planning environment.

In evaluating the degree of environmental sustainability provided

by the regulations, it is important to view them as part of a broader regulatory strategy. This strategy consists of these regulations under the *Fisheries Act* to address conventional pollutants (TSS and BOD) and acute lethality, as well as two regulations under CEPA to prevent the formation of chlorinated dioxins and furans. The latter regulations apply to all mills where chlorine bleaching is used.

Possible alternatives to these regulations are:

- use of market instruments such as a monetary charge per unit of pollutant released;
- tradeable emission permits;
- voluntary compliance by means of an industry code of practice or other measures;
- revocation of federal regulations and reliance on provincial regulations; and
- development of a one-window regulatory approach for provincial and federal authorities.

Team Findings

1. The current regulations should be retained.
2. An administrative agreement with British Columbia for the implementation of the regulations should be developed as soon as possible.

Appendix B.1

Individuals and groups who participated in consultations or provided written submissions

Betz Inc.

Canadian Pulp and Paper Association

Diachem Industries Limited

Drew Chemicals Limited

Hercules Canada Inc.

ICI Canada Inc.

MacMillan Bloedel Limited (Port Alberni)

New Brunswick Conservation Council

Petro-Canada

Rawson Academy of Aquatic Science

Société pour vaincre la pollution

West Coast Environmental Law Association
and Research Foundation

INTRODUCTION**List of Regulations**

- Category 1** ■ Export and Import of Hazardous Wastes Regulations
- Category 2** ■ Chlorobiphenyls Regulations
 ■ PCB Waste Export Regulations
 ■ Storage of PCB Material Regulations
 ■ Federal Mobile PCB Treatment and Destruction Regulations
- Category 3** ■ Polybrominated Biphenyls Regulations
 ■ Polychlorinated Terphenyls Regulations

Review Team

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Review Process

The Regulatory Review Office wrote to some 2000 stakeholders to advise them of the review and solicit their opinions concerning the effect of the regulations on competitiveness and sustainability and concerning the

possible use of alternative approaches to regulation.

In addition, the review team wrote to a sample of 50 of the 600 Canadian exporters and importers of hazardous wastes that had provided a notification to Environment Canada in 1992,

advising them of the review and soliciting their opinions on Category 1 Regulations. The review team also wrote to a sample of 200 of the 5600 persons registered to use or store PCBs in Canada, soliciting their opinions on Category 2 and Category 3 Regulations. Individuals and groups who participated in consultations or provided written submissions are listed in Appendix C.1.

Each of the seven regulations was assessed against the Environment Canada review criteria. Questions were asked to determine factors such as relevancy, redundancy, compliance costs, and benefits. Attention was given to whether these regulations imposed barriers or disincentives to competition and whether they contributed to sustaining the quality of the environment. All stakeholder views were taken into account.

CATEGORY 1

EXPORT AND IMPORT OF HAZARDOUS WASTES REGULATIONS (SOR/92-637, November 12, 1992)

Regulatory Profile

Hazardous wastes are produced in the manufacture of chemical-based products, even at plants with on-site reduction and recycling programs. These dangerous wastes pose the formidable challenge of how to manage them safely, with minimal risk to the environment and human health.

In the 1980s, international concern about this problem was high and was

strongly expressed by the developing countries. The United Nations, through its Environment Program, proposed the Basel Convention, which was signed in March 1989 by 34 countries including Canada and the European Community. This Convention is aimed at controlling international movements of hazardous wastes destined for disposal or recycling. Member countries agree that movements of hazardous wastes must be managed in an environmentally sound manner. In essence, one country should not be allowed to use another country as a dumping ground for hazardous wastes; there must be informed consent. For its part, Canada undertook to regulate all transboundary movements (export, import, and transit) of hazardous wastes under its jurisdiction. Canada ratified the Basel Convention on August 28, 1992.

Parties to the Basel Convention cannot permit hazardous wastes to be exported to a nonparty or to be imported from a nonparty, unless there is an agreement between the two countries. In the case of Canada and the United States, the Canada-U.S. Agreement on the Transboundary Movement of Hazardous Wastes allows Canada to keep the border open between the two countries (the United States is not yet party to the Basel Convention). As for shipments to other countries, the movement can continue with OECD countries for hazardous wastes destined for recycling, and with countries party to the Basel Convention for hazardous wastes destined for recycling or disposal.

As well, on March 30, 1992, Canada adopted, along with the other OECD countries, the OECD Decision of the Council Concerning the Control of Transfrontier Movements of Wastes Destined for Recycling Operations. It allows for the establishment of a system of appropriate controls for movements of recyclable hazardous wastes among member countries of the OECD.

The Export and Import of Hazardous Wastes Regulations (EIHWR), pursuant to the *Canadian Environmental Protection Act*, take into account the provisions of the Basel Convention and of the OECD Decision for recyclables. These regulations became effective on November 26, 1992.

The regulatory objective is to have Canadian exporters of hazardous wastes obtain prior consent from the receiving country, through Environment Canada, before exporting their wastes. The same objective applies for hazardous wastes to be imported into Canada. In the case of imports, consent must be obtained by the Canadian importer, through Environment Canada, from the receiving province.

In 1992, Environment Canada received approximately 2000 notifications from some 600 companies.

Stakeholder Views

Environment Canada consulted extensively with stakeholders during the development of the Export and Import of Hazardous Wastes Regulations in

1991 and 1992. Among those consulted were other federal government departments, provincial governments, environmental groups, and industry. A federal government-industry task force was established by Environment Canada in September 1990, co-chaired by the President of the Mining Association of Canada, to prepare recommendations for the controls to be included in the regulations. By listening to the concerns of all stakeholders, including the recycling industry, the task force paved the way for the development of the regulations.

The stakeholders' main concerns were taken into account. The major comments that were received related to:

- the burden associated with the controls on recyclable hazardous wastes;
- the timing of Environment Canada responses to notices;
- the limits that the regulations impose on trade in hazardous wastes with countries that do not ratify the Basel Convention;
- the need to allow for electronic data transfer in lieu of paper forms;
- the uncertainty on the part of importers of hazardous wastes as to the applicability of the leachate test;
- the uncertainty on the part of importers and exporters of hazar-

dous wastes as to the requirements for mandatory insurance coverage of the shipments;

- the uncertainty on the part of affected parties as to the distinctions between wastes destined for disposal and wastes destined for recycling; and
- the rigidity of the current regulations.

Assessment and Analysis

The main objective of the regulations is to implement adequate controls for transboundary movements of hazardous wastes going out of or coming into Canada, whether destined for disposal or recycling, in order to secure the consent of the receiving country or province prior to shipment, and to ensure the environmentally sound management of the wastes. There are no other regulations, federal or provincial, in place that meet the purpose and objectives of these regulations. However, the Transportation of Dangerous Goods Regulations complement these regulations by providing safety provisions such as requirements for packaging, safety marks, and manifesting during transport.

The federal government has jurisdiction over international affairs. Parties to the Basel Convention, including Canada, have the responsibility not to allow the export of hazardous wastes if the country of import does not consent to receive the shipment, or if the country of export has reason to

believe that the wastes to be exported will not be managed in an environmentally sound manner. The responsibility is also on the Canadian government to control the import of foreign wastes, in collaboration with the provinces, in order to protect public health and the environment in Canada.

All of Canada's trading partners, including the United States, Japan, and the European Community, are in the process of developing or finalizing similar regulations to deal with the Basel Convention and the OECD Decision for recyclables. The European Community, for example, published regulations on February 6, 1993, and intends to ratify the Basel Convention by February 6, 1994.

There is no change to the compliance costs for provincial and territorial governments since the required procedures have not changed further to the implementation of these regulations.

Industry costs relate to satisfying the requirements and to providing insurance. The costs associated with the requirements were expected, in the RIAS, to be minimal as they would relate to the paper burden.

When the regulations were approved, the RIAS indicated that the insurance costs would be approximately \$20,000 for coverage of \$5 million for hazardous wastes destined for disposal. When insurance was to be applied for recyclable wastes, insurance costs were estimated at

\$20,000 for coverage of \$1 million. Canada's main trading partners have already implemented or are expected to implement similar requirements in the near future. This will provide a level playing field concerning insurance costs.

Given the lack of data, benefits could not be quantified. Nevertheless, both quantitative and qualitative benefits are expected.

The main benefits of the disposal sections of this regulatory initiative will be felt outside Canada by those countries that are currently subjected to pollution caused by the improper disposal of exported hazardous wastes. These will include an improvement in environmental and public health, including reduced risk of mortality. The qualitative benefits include:

- a reduction in improper disposal of hazardous wastes, thereby minimizing future clean-up costs, domestically and abroad;
- a reduction in the risk of long-term contamination of the Canadian environment;
- better information concerning the production of hazardous wastes, their export abroad, and their import to Canadian destinations; and
- a reduction in the risk of accidents during transport.

For the sections of the regulations dealing with recycling, the following benefits stand out:

- reduced risk of contamination of the environment in Canada;
- an improvement in the environment and the health of Canadians, since imported recyclable hazardous wastes will be treated in an environmentally sound manner;
- better information concerning the production and movement of recyclable hazardous wastes;
- a reduction in the illegal trade in recyclable hazardous wastes;
- saving in raw materials due to increased use of recycled hazardous wastes as inputs for various industrial sectors;
- encouragement for firms to innovate, in order to better manage and re-use their hazardous wastes; and
- a reduction in the volume of hazardous wastes destined for disposal.

From the competitiveness perspective, the Export and Import of Hazardous Wastes Regulations provide a level playing field for Canadian companies involved in the export and import of hazardous wastes whether destined for disposal or recycling. The EIHWR establish the same conditions for any company exporting or importing hazardous wastes anywhere in Canada.

The costs companies in Canada incur in complying with these regulations will be essentially the same as those

borne by similar companies in any country applying the requirements of the Basel Convention and the OECD Decision for recyclables. By implementing provisions put in place by the international community, the regulations provide an incentive for Canadian industry to use competitive technology in order to be part of that level playing field.

The regulations achieve environmental targets too. One of the main goals of the Green Plan is to cut waste by 50 per cent by the year 2000. That goal involves a reduction in waste generation at source, but also includes reduction, re-use, and recycling programs. The Export and Import of Hazardous Wastes Regulations support this goal by providing effective controls for hazardous wastes destined for disposal, and establish appropriate controls for hazardous wastes exhibiting moderate risks and destined for recycling operations within OECD countries. These regulations allow Canadian companies to fully participate in the international markets for recyclable hazardous wastes while ensuring that other countries and Canada's provincial governments are adequately informed to make decisions on materials destined for disposal. The regulations

ensure that the wastes are managed in an environmentally sound manner, thereby encouraging pollution prevention as opposed to "after the fact" clean-up.

Because of the international legal requirements associated with Canada being party to the Basel Convention, no alternatives were found that would provide the degree of confidence required to satisfy Canada's international obligations.

In summary, the regulations meet the requirements of the Basel Convention. They provide a level playing field for Canadian companies involved in transboundary movement of hazardous wastes. They promote environmental sustainability by allowing only those transboundary shipments of hazardous wastes that have been consented to by the receiving authority and that will be transported and disposed of in an environmentally sound manner. As well, the regulations allow Canada's borders to remain open to export and import of hazardous wastes by providing adequate controls in order to protect human health and the environment. They also permit legitimate transboundary movements of hazardous wastes destined for recycling.

Team Findings

1. Environment Canada should retain the regulations and continue to implement them by supporting industry in its efforts to continuously improve its compliance level.
2. Whenever any substantive amendments become necessary, the federal government regulatory process should be invoked.

CATEGORY 2

CHLOROBIPHENYLS REGULATIONS

(SOR/91-152, February 21, 1991)

PCB WASTE EXPORT REGULA-

TIONS(SOR/90-453, July 27, 1990)

STORAGE OF PCB MATERIAL

REGULATIONS (SOR/92-507,

August 27, 1992)

FEDERAL MOBILE PCB TREATMENT

AND DESTRUCTION REGULATIONS

(SOR/90-5, December 14, 1989)

Regulatory Profile

PCBs are synthetic chlorinated organic compounds that were first used commercially in the 1930s. The physical and chemical properties of PCBs make them ideal for a variety of uses, such as in electrical and heat transfer equipment. Although PCBs were never manufactured in Canada, an estimated 40,000 tonnes of high-concentration PCB liquids were imported into this country, mainly from the United States.

Monsanto, the only manufacturer of these substances in the United States, stopped PCB production in 1977. Monsanto's action was consistent with scientific evidence in the 1970s that indicated that PCBs were harmful to human health and toxic to some aquatic species, accumulated in animal tissues, and, because of their stability, degraded slowly in the environment.

Incidents, such as the spill of PCBs onto the Trans-Canada Highway near Kenora, Ontario, in 1985; the release in 1985 of PCBs to the environment from an abandoned PCB transfer station and storage site at Smithville, Ontario; the fire at a PCB warehouse in Saint-Basile-le-Grand, Quebec, in 1988; and the refusal of British dock workers to accept a 1989 shipment of PCB wastes from Canada, have helped to maintain a high profile for the PCB issue.

About 40 per cent of the PCBs imported into Canada remain in service, about 15 per cent have been destroyed, about 15 per cent are in storage either as material not in daily use or as wastes, and about 30 per cent are unaccounted for and are presumed to be in the environment. There are no regulations that require that PCBs be taken out of service and destroyed.

The PCB regulations⁴ that have been promulgated by Environment Canada, beginning in the 1970s, restrict the commercial, manufacturing, and processing uses of PCBs; limit the release of PCBs to the environment; and ensure that PCB wastes are stored safely and destroyed to the extent possible within Canada.

Three regulations were enacted under section 18 of the 1975 *Environmental Contaminants Act*; these are:

⁴The phrase "PCB regulations" is used in this report in the collective sense, and is not used as a synonym for the Chlorobiphenyls Regulations.

- Chlorobiphenyl Regulations No. 1 (PCBs) (1977), which restricted PCB use to certain kinds of equipment. These regulations were subsequently amended to prohibit the use of PCBs as a constituent of prescribed electrical equipment manufactured in or imported into Canada after July 1, 1980.
- Chlorobiphenyl Regulations No. 2 (Products) (1985), which prohibited the sale of any type of equipment containing greater than 50 parts per million by weight PCBs.
- Chlorobiphenyl Regulations No. 3 (Release) (1985), which limited the release of PCBs into the environment from prescribed sources and activities.

In 1988, the three chlorobiphenyl regulations under the *Environmental Contaminants Act* were subsumed under the *Canadian Environmental Protection Act* (CEPA), initially by an Interim Order and then as the Chlorobiphenyls Regulations.⁵

Three other PCB regulations enacted under CEPA are also the subject of this review; these are:

- PCB Waste Export Regulations;
- Storage of PCB Material Regulations; and

- Federal Mobile PCB Treatment and Destruction Regulations.

The Chlorobiphenyls Regulations do not require regulated parties to report to or interact directly with the federal government. However, CEPA requires reporting of the release of PCBs (scheduled toxic substances) in contravention of a regulation. The regulations restrict the commercial, manufacturing, and processing uses of PCBs and the sale of PCBs, and therefore may require the regulated parties to modify certain equipment, products, and business practices.

The three PCB waste regulations under review impose direct requirements on regulated parties.

Under the PCB Waste Export Regulations, export of any PCB waste is prohibited, except to the United States, where there is a requirement to obtain prior consent from the U.S. Environmental Protection Agency.

The Storage of PCB Material Regulations control all aspects of storage, including access, container specifications, inspection schedules, record keeping, reporting, and so on.

Under the Federal Mobile PCB Treatment and Destruction Regulations, federal institutions must ensure that a

⁵The current Chlorobiphenyls Regulations were in the process of being revised, and extensive public consultation on the proposed revisions had already taken place, before the present review began. The major revisions proposed pertain to: a prohibition on the use of PCBs in sensitive locations (e.g., schools and hospitals); mandatory labelling and reporting of in-use PCBs; release of PCBs to the environment; and exemptions to the regulations for specific commercial activities and products. These proposed revisions to the Chlorobiphenyls Regulations will be evaluated in light of the conclusions arising from the present review.

person who operates a mobile PCB treatment or destruction system under contract with them complies with the requirements of the regulations. These requirements include PCB release limits, ministerial authorizations, and testing of equipment.

There are no international or bilateral treaties, conventions, agreements, or memoranda of understanding that explicitly require that PCB regulations be developed in Canada.

Stakeholder Views

Recent Reviews

During the development of the PCB regulations, Environment Canada consulted with various stakeholders.

CHLOROBIPHENYLS REGULATIONS

In keeping with CEPA requirements, before the February 1989 Chlorobiphenyls Interim Order could be approved by the Governor General in Council, the Minister of the Environment offered to consult with the governments of all the affected provinces to determine if they were prepared to take sufficient action to deal with the significant danger posed by PCBs. In addition, before the Interim Order could be approved, the Minister of the Environment consulted with other Ministers of the Crown to determine whether any action could be taken under any other Act of Parliament to deal with the danger. The Chlorobiphenyls Regulations contain the same provisions as the February 1989 Interim Order.

PCB WASTE EXPORT REGULATIONS

At the October 19, 1989, meeting of the Canadian Council of Ministers of Environment (CCME), there was agreement that destruction of Canada's PCBs should be carried out to the maximum extent possible within Canadian borders. Some concern was expressed by the CCME about the proposed complete prohibition on the export of PCBs. On November 6, 1989, a press release was issued to inform companies involved in PCB waste export that regulations were being proposed to ban such exports. No unfavourable reaction to the press release was received by Environment Canada. On November 28, 1989, consultations were held with companies that arrange for the export of PCB wastes. Other government departments and agencies were informed of the objectives and content of the regulations.

Following publication of the proposed PCB Waste Export Regulations in Part I of *Canada Gazette* on February 24, 1990, notices of objection were received by Environment Canada requesting the establishment of a board of review to investigate the nature and danger posed by PCBs in the context of this regulation. Environment Canada met with companies that filed notices of objection. The Minister of the Environment decided not to establish a board of review.

STORAGE OF PCB MATERIAL REGULATIONS

In September 1988, the Minister of the Environment made an Interim

Order on the storage of PCB wastes. The Interim Order was made because the Minister believed that immediate action was required on this matter.

In keeping with the requirements of CEPA, the Minister consulted with the provincial governments and consulted with other Ministers of the Crown.

The proposed Storage of PCB Material Regulations were published in *Canada Gazette*, Part I on June 9, 1992. The proposed regulations had previously been presented to the CEPA Federal-Provincial Advisory Committee and to the CCME in January 1990. Other government departments and agencies were asked to review and comment on the regulations.

Provinces indicated that they preferred to have the regulations apply only to federally owned PCB storage sites, with nonfederal sites subject to provincial regulations. The decision was taken by Environment Canada to have the PCB storage regulations apply nationally, and to enter into equivalency agreements with the provinces as needed, as provided for under CEPA. The Department of National Defence submitted a notice of objection with respect to the proposed regulations, and was granted an exemption for the storage of PCB used in equipment that is an integral part of tactical equipment and is in storage for future use. Other comments were received seeking clarification of the application of the regulations, but no significant changes were made to the regulations as a result.

FEDERAL MOBILE PCB TREATMENT AND DESTRUCTION REGULATIONS

Federal, provincial, and territorial Ministers of the Environment, through the CCME, agreed on the need for mobile PCB destruction facilities. The proposed Federal Mobile PCB Treatment and Destruction Regulations were discussed with all provinces to ensure that the standards would meet provincial requirements.

Other federal agencies and departments, and selected nongovernmental organizations and industrial associations were consulted.

Written comments received in response to publication of the proposed regulations in *Canada Gazette* Part I on August 15, 1989, indicated agreement with them.

In addition to the consultations held during the development of the various PCB regulations, Environment Canada formally consults with 26 other federal government institutions (departments, agencies, boards, and corporations) on the PCB issue on a quarterly basis through the Inter-departmental Committee on the Federal PCB Destruction Program.

The Federal PCB Destruction Program supports activities such as public education, consultation, site selection process, development of PCB management plans, and environmental assessment, which must be conducted before PCB destruction begins. Federal PCB owners are expected to pay for the decommissioning, storage,

transport, and destruction of their wastes.

The costs for mobilizing and demobilizing a large mobile PCB destruction unit are high, and facilities are to be made available in several regions of the country. The federal government is committed to making mobile PCB destruction facilities available to nonfederal PCB owners, in conjunction with the destruction of federal wastes, on a cost-recovery basis.

Current Review

A consultation process was instituted by the Regulatory Review Office whereby notices and letters announcing the current review and requesting comments were distributed by mail to federal government departments and the regulated community. As the regulated community comprises over 5000 owners and users of PCBs, the review team sampled that population by first establishing separate lists of persons registered to use or store PCBs in Canada. Each list was then subdivided by taking into consideration the amount of PCBs held and the geographical location of the PCBs. A list of 200 contacts was identified for the consultation process. Letters were sent directly to these 200 contacts, 12 of whom responded.

In addition, all members of the Inter-departmental Committee on the Federal PCB Destruction Program were asked to comment on the regulations.

Assessment and Analysis

The regulations under review do not duplicate the effects or objectives of other regulations, with the exception of PCBs storage. Discussions are underway between the federal government and the nine provinces that have requirements for storage of PCB wastes, to achieve harmonization.

The environmental problems addressed by the regulations on the export and import of PCBs could not be handled entirely by another level of government, because of the international dimension.

The consultation process provided the review team with very limited information on the costs to industry of complying with the regulations. Therefore, the review team could not estimate compliance costs with any degree of accuracy.

However, there are costs associated with storing PCBs. When PCBs can be destroyed, there are also destruction costs. As well, Alberta has the only fixed facility in Canada licensed to destroy PCBs and it accepts PCB wastes only from that province.

One respondent provided the review team with cost of compliance figures: the cost for two storage facilities was \$130,000; the cost between 1989 and 1992 to replace the PCB equipment in storage was \$301,000; and the total cost over the past decade was in the order of \$1 million. The review team independently estimated

the cost of the 2500 storage sites at \$50 million (capital cost – \$15,000 and consulting\ design – \$5,000 per site). Cost of destruction of the total national PCB inventory was estimated at \$600 million.

The intended benefit of the regulations is to keep PCBs out of the environment and thereby protect both human health and the environment. Canadian legislation was implemented to restrict PCB use, and PCBs continue to be taken out of use to be stored or destroyed according to regulatory requirements. These actions reduce the potential for release into the environment, benefiting public health in general and reducing the risk of spills and associated clean-up costs. The costs of clean-up are significant; for example, the cost to clean up the abandoned PCB transfer station at Smithville, Ontario, is estimated to be \$25 million.

The benefits of avoiding lost work time and adverse health effects are not possible to quantify.

All Canadians benefit from the regulations and their contribution to pollution prevention, but particular benefits accrue to infants, who may be exposed to PCBs through ingestion of milk; sports fishermen, and other people who may consume significant quantities of fish containing PCBs; and food producers, who want to market PCB-free products. Aquatic wildlife also benefits, as many aquatic species are particularly sensitive to PCBs.

The fact that PCBs must now be destroyed in Canada brings attendant economic benefits to the PCB service industry.

From a competitiveness perspective, these regulations are solid, but some challenges remain. Worldwide regulation of PCBs has created opportunities for industry to manufacture and market PCB substitutes, and for entrepreneurs to develop PCB destruction technologies and to provide PCB management services. The four federal PCB regulations under review did not present any barriers to Canadians who wanted to take advantage of these opportunities, except for one. Before the PCB export ban, a few Canadian companies provided services to facilitate the shipment of Canadian PCB wastes overseas for destruction. After August 1990, these companies could no longer provide these services.

There is no evidence to suggest that the adjustment costs associated with the four PCB regulations have been greater for Canada than for its trading partners and competitors. Nevertheless, with regard to the United States, Canada's major trading partner, there are differences in PCB management philosophies and policies, which are reflected in the two countries' PCB regulations. These differences could be meaningful in terms of competitiveness.

For example, under the U.S. legislation, the Environmental Protection Agency has discretionary authority

over some of the statutory provisions for PCBs, and can grant exemptions in special circumstances. As well, although storage requirements are comparable in both countries, under U.S. law PCBs can be stored for only one year, after which they must be destroyed. This condition precludes long-term storage and its associated costs, and most owner liability. Under U.S. law, the PCB owner retains a portion of the liability for any clean-up costs at the contractor's disposal or destruction site if contamination occurs.

In Canada, where opportunities for PCB destruction are minimal, the liability may be significant. Alberta is reviewing its policy of accepting only Alberta PCBs at its destruction facility. Also, mobile destruction units are to be established in Eastern Canada under the Federal PCB Destruction Program.

The regulations have an overall positive effect on the quality of the environment, and support the general Green Plan goal of better management of toxic chemicals and the specific Green Plan goal of destruction of federal PCBs in mobile facilities in Atlantic Canada, Quebec, and Ontario. Environmental sustainability, however, is not well served by the long-term storage of PCB wastes because there is always potential for inadvertent release. Nevertheless, sustainability is enhanced by the stringent storage requirements the regulations impose on all those who own, store, possess, or manage PCB material.

The regulations were based upon "best available" scientific knowledge and they promote technology development. They are clearly of a pollution prevention nature.

The question of alternatives was reviewed. One possible alternative is the use of consensus standards. These standards could be developed for PCB storage, transportation, and destruction, and cited by federal and provincial regulatory authorities as mandatory requirements.

As regulations are already in place that specify standards, voluntary standards could be developed relatively quickly. Voluntary standards would carry no direct sanctions, however, and would have to be referenced in a regulation to do so.

Another potential alternative is possible through the work of the Geneva-based International Standards Organization (ISO). It has instituted the ISO 9000 international process, through which companies are setting voluntary generic standards for varying degrees of quality management and quality assurance for many company operations (design, production, inspection, marketing, etc). ISO 9000 is being extended to include environmental operations. If standards for PCB management were included, registration and certification of good management, which must be achieved through independent audit, could provide a competitive advantage to Canadian companies conducting

business in countries where the standards are recognized. The integrity and skill of a company, however, are the ultimate determinants of the quality of its operations.

It could be argued from the preceding that the objectives of the PCB regulations might be achieved to a large extent by industry, and by others who own, control, and use PCBs, on their own initiative. However, the recent history of the PCB issue in Canada, up to the time when the four PCB regulations under review were put in place, is characterized by highly publicized incidents where PCBs have been released to the environment, as described earlier.

Although these incidents can be attributed largely to unsatisfactory PCB management practices by a few owners and users of PCBs and a few entrepreneurs providing PCB management services, the fact that they did occur is not supportive of across-the-board self-regulation. Those registered to use or store PCBs in Canada would be unlikely to achieve the intended benefit of eliminating all Canadian sources of PCBs to the environment.

In summary, uniform requirements for the management of PCBs are necessary to help ensure Canada's domestic and international competitiveness; therefore, government intervention is justified. The regulations should be the responsibility of Environment Canada. Uniform regulations, because of the sanctions associated with them, are the best approach, and provide maximum gain to the beneficiaries in relation to the cost to governments, businesses, and Canadian citizens.

Based on the public reaction to releases in the past, effective compliance means no releases. The high cost of PCB clean-up supports this view of effective compliance. Effective compliance depends largely on the honesty, skill, and integrity of the owners and users of PCBs. Without these ingredients, large government and private sector expenditures would be needed to ensure compliance. Resources are available to carry out inspections of PCBs storage in accordance with the CEPA enforcement and compliance policy.

There are no alternative approaches to propose immediately.

Team Findings

1. The PCB regulations should be retained and the proposed amendments to the Chlorobiphenyls Regulations should be implemented.
2. Environment Canada should pursue harmonization of the federal and provincial requirements governing PCB storage and continue to offer to enter into CEPA equivalency or administrative agreements with the provinces.

CATEGORY 3

POLYBROMINATED BIPHENYLS

REGULATIONS (SOR/90-129,

February 15, 1990)

POLYCHLORINATED TERPHENYLS

REGULATIONS (SOR/90-128,

February 15, 1990)

Regulatory Profile

Polybrominated biphenyls (PBBs) are used as flame retardants in plastics and synthetic fibres. PBBs were produced in the United States and West Germany. Only one company in Canada used substantial quantities of PBBs, but it discontinued their use in 1975.

In 1977, an Environment Canada study determined that high concentrations of PBBs were present in a number of species of mammals, fish, and birds. PBBs were found to be extremely persistent in soils. The acute toxicity of PBBs to many animal species is rather low, but both mink and guinea pigs were found to be highly sensitive to PBBs. There was also much evidence of chronic toxicity to various species, including rats, chickens, cattle, and sheep. PBBs were found to adversely affect the reproduction of birds, and mammals. Bioaccumulation of PBBs was frequently observed in fish, birds, and mammals, including humans.

In 1977, Environment Canada also undertook a study on polychlorinated terphenyls (PCTs). It showed that PCTs had been used commercially in Canada in a pressure-sensitive

adhesive for weatherstrip backing, as plasticizers for urethane, and in paints. PCTs were found in the eggs and fatty tissues of herring gulls, in paperboard samples, in food packaging materials, in corrugated cardboard, and in garbage samples collected across Canada.

Studies in other countries found PCTs in river water, oysters, eels, wall scrapings from concrete stave silos, silage, milk, activated sludge from sewage treatment plants, food wrappers, livers of birds, and human fat, blood, and breast milk. Studies in several countries have also shown that PCTs accumulate in the liver and in several other tissues of several species and are biologically active in various ways.

The original Polychlorinated Terphenyls Regulations and Polybrominated Biphenyls Regulations were issued in 1979 under the authority of the *Environmental Contaminants Act*. They were later transferred to CEPA. They ban importation as well as all commercial, manufacturing, and processing uses of PCTs and PBBs.

During the development of the regulations, the provinces and territories, as well as all federal departments, agencies, and corporations, were consulted to determine whether they had similar regulations or any intention to develop similar regulations. Neither the provinces nor other federal government departments had a need for similar regulations. Health Canada was directly involved with Environment Canada in the develop-

ment of the regulations because of their shared responsibility for the administration of the *Environmental Contaminants Act* and, subsequently, CEPA.

The PBB and PCT regulations are monitored on a three-year cycle. Approximately one month every three years is spent on verifying compliance with each regulation through literature reviews and consultations with embassies of foreign governments.

There are no reporting requirements under these regulations, and there have been no ongoing enforcement activities related to them.

The regulations are compatible with similar controls placed on the use of these substances in the United States. The European Community forbids the use of PCTs and waste oils with a PCT content higher than 0.005 per cent by weight. It also prohibits the use of PBBs in textile articles that come into contact with the skin. However, there are no restrictions on the use of these substances in Honduras, Mexico, or South American countries.

Stakeholder Views

There have been no reviews or consultation since the development of the regulations in 1979. For this review, 200 enterprises listed in the PCB database were approached by the review team and their comments on these regulations were solicited. No responses were received. It is the view of internal stakeholders that

these regulations are still necessary to prevent the manufacture, import, and use of PBBs and PCTs.

Assessment and Analysis

These regulations are required to prohibit the manufacture in Canada and the import into Canada of these substances. The regulations do not duplicate the effects or objectives of other regulations established by the federal government or by another level of government.

The objective of the regulations as they pertain to manufacture and processing could undoubtedly be met by Canadian industry without regulation; however, because these substances are still used in other countries, regulations are necessary to prevent their import, use, and marketing in Canada.

The regulations do not affect the competitiveness of Canadian companies because alternative substances are less expensive and more readily available. Since these substances are banned in Canada, there are no ongoing compliance costs to industry or to provincial, territorial, or municipal governments.

From the environmental viewpoint, all forms of life benefit from the prevention of the release of these substances into the environment. The regulations therefore contribute to environmental sustainability.

No alternatives to the outright prohibition on the manufacture, processing,

and importation of PBBs and PCTs were considered. Because these substances pose a significant threat to human health and the environment, and because of the continued use of

these substances in countries that trade with Canada, it is considered essential to control their use and dispersal in the environment by regulations.

Team Findings

1. The regulations should be retained and compliance should continue to be monitored to ensure that PCTs and PBBs are not being imported into Canada.

APPENDIX C.1

Individuals and groups who participated in consultations or provided written submissions

Category 1 Regulations

Natural Resources Canada

Environment Canada (Quebec Region), (Western and Northern Region), and
(Saskatchewan District Office)

Falconbridge Limited

Mining Association of Canada-Noranda

Nova Scotia Power

Category 2 and Category 3 Regulations

Agriculture Canada

Anachemia Solvents Limited

Brunswick Mining and Smelting

Canadian Pulp and Paper Association

Cominco Metals

Health Canada

Nova Scotia Power

Parkland Refining Limited

Smith & Nephew Inc.

Stoney Creek Hydro-Electric Commission

Supply and Services Canada

The Mining Association of Canada

Windsor Utilities Commission

INTRODUCTION

List of Regulations

- Petroleum Refinery Liquid Effluent Regulations
- Fuels Information Regulations No. 1
- Gasoline Regulations
- Contaminated Fuel Regulations

Review Team

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Kelly Karr
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Review Process

This review is based on information gathered from people both inside and outside the federal government. Written submissions were sought from petroleum product producers, users, and environmental non-governmental organizations (ENGOS). Of those surveyed, approximately

85 per cent of the producers, 67 per cent of the users, and 10 per cent of the ENGOS provided written comments. Various other public and private organizations and individuals gave viewpoints in writing. Individuals and groups who participated in consultations or provided written submissions are listed in Appendix D.1.

Stakeholder views were analyzed and then summaries were sent to stakeholders to confirm that their views had been adequately captured.

Each of the four sets of regulations was assessed against the review criteria: current relevancy, redundancy, compliance costs, and benefits. Particular attention was given to determining whether each set of regulations imposed barriers to competitiveness and whether each promoted or hindered environmental sustainability. Possible alternatives to the regulations were identified based on the analysis of each set of regulations and stakeholder viewpoints.

PETROLEUM REFINERY LIQUID EFFLUENT REGULATIONS (CRC, 1978, Vol. VII, c. 828)

Regulatory Profile

The Petroleum Refinery Liquid Effluent Regulations were introduced under the authority of the *Fisheries Act* to control the discharge of petroleum refinery effluents into watercourses populated by fish. The *Fisheries Act* prohibits the deposit of deleterious substances in waters frequented by fish.

In 1972, there were 40 petroleum refineries operating in Canada, with a total crude oil capacity of about 1.7 million barrels per day. Discharges by these refineries of oil and grease, phenols, sulphide, ammonia nitrogen, and total suspended matter were studied and found to be unacceptable.

Environment Canada formed a joint industry-government task force early in 1972 to develop uniform water effluent regulations for the petroleum refining industry. The outcome of this task force was the Petroleum Refinery Liquid Effluent Regulations, which were promulgated in November 1973. The regulations apply to refineries started on or after November 1, 1973. They set limits on the amount of oil and grease, phenols, sulphide, ammonia nitrogen, and total suspended matter that can be contained in refinery effluent. The regulations also specify pH limits for effluent.

An associated set of guidelines resulted from the task force and was also examined. These guidelines apply to pre-1973 refineries and control the same parameters but less stringently. In addition, the guidelines state an acute fish toxicity limit for all refineries. The regulations and guidelines set a national standard which required the application of the best practicable treatment technology at the time they became effective.

Each refinery is required to test its effluent for each of the five regulated substances three times per week and to record the amount of these substances being discharged on those days. In addition, the pH level of the effluent must be measured daily. Refineries that are subject to the regulations must report the results of these tests. The test method for analyzing each parameter is specified by the regulations. All refineries are

requested under the guidelines to perform one fish toxicity test each month. The results of all analyses are to be reported monthly.

The regulations were not introduced to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding.

Prior to the federal regulations and guidelines on petroleum refinery effluent issued in 1973, Ontario had water quality objectives and a permit system for these refineries, and Quebec had a regulation. The establishment of the federal regulations and guidelines introduced new effluent parameters and more stringent limits for all refineries in Canada. Since then, provinces and territories have used a permit system based mainly on the federal regulations and guidelines to control petroleum refinery effluent. Ontario has recently updated its regulations and Quebec is scheduled to do so in 1993.

Unlike Canada, the United States limits petroleum refinery effluents on the basis of process unit allocations rather than crude throughput. A comparison of compliance in both countries, carried out by Environment Canada in 1988, indicated that little additional capital investment would be required for the Canadian refineries to meet the U.S. limits.

The last environmental report pertaining to the regulations was published in 1990 and applied to 1987. Of the

seven refineries under the regulations, only two were not in compliance for certain parameters or for failing to report. During the last four years (1989-92), there have been 26 inspections, one investigation, and one warning.

Stakeholder Views

In 1988, Environment Canada conducted a comprehensive review of the regulations and guidelines. The review indicated that refineries were capable of discharging far less than allowed. It also found that the regulations were becoming difficult to apply due to changes in refinery technology. As well, the interpretation of some aspects of the requirements under the regulations, including the definitions of "refinery" and "crude oil", had become problematic.

In July 1990, the authors of Environment Canada Report EPS 1/PN/3, *Environmental Status Report for the Canadian Petroleum Refining Industry 1987*, recommended that the federal Petroleum Refinery Liquid Effluent Regulations and Guidelines be reviewed and updated to reflect changes in the industry, current analytical methodology, and increased emphasis on toxic chemicals.

With regard to the present review, approximately 75 per cent of the producing companies and one user organization provided explicit comments on the regulations.

The Canadian Petroleum Products Institute (CPPI), representing the

major oil companies, indicated that there are overlaps with provincial regulations in some provinces, and that some provincial regulations may be more stringent. It would like to see the overlap removed by eliminating federal regulations where provincial regulations and permits achieve the same results. CPPI also indicated that the regulations are based on specific limits that once met do not encourage further reduction or elimination of regulated pollutants in effluents. One stakeholder recommended that the regulations be harmonized with provincial regulations, while another pointed out that the federal regulations are referenced by some provinces during the permit renewal process.

Views of internal stakeholders generally coincided with those of external stakeholders. Internal stakeholders proposed that all refineries in Canada should be regulated, that is, application of the regulations should not be based on the year of construction. They see the need for a national minimum baseline standard and are in favour of changes to the regulations that would address numerous technical problems with the application and interpretation of the regulations.

Assessment and Analysis

Since the Petroleum Refinery Liquid Effluent Regulations and Guidelines took effect in 1973, refineries have successfully complied with them through changes in refining processes and the availability of better control

technology. Furthermore, refineries that used large amounts of water have closed and those remaining are capable of discharging far less effluent than their allowable loadings.

There are currently 25 refineries operating in Canada. Seven are covered by the Petroleum Refinery Liquid Effluent Regulations. Permits for effluent discharges issued by the provinces in four of the five Environment Canada regions are based on the federal requirements. In Quebec, the 1977 provincial regulations use the federal guidelines as the base for all refineries. Ontario's recently promulgated MISA regulations are more stringent than the federal regulations. Although Alberta has no specific regulations for refineries, its permits stipulate more stringent requirements than the federal regulations.

Regulations are necessary to ensure that oil companies treat their wastewaters. However, oil refineries in Canada are subject to federal regulations and guidelines, provincial regulations or permit systems, and, in certain cases, municipal bylaws. This overlap and duplication appear to be inefficient.

The annual compliance costs for the regulatory aspect of the Petroleum Refinery Liquid Effluent Regulations and Guidelines could be as high as \$2 million for an average refinery. These costs are associated with the operation of a wastewater treatment plant and various monitoring and reporting functions. A refinery sub-

ject to the federal regulations spends close to \$100,000 annually on monitoring alone. The cost of regulatory monitoring to refineries would be virtually the same without the federal involvement except where provinces regulate different or additional substances in the effluent. Some municipalities also monitor effluent. For example, the Montreal Urban Community spends about \$5000 per year per refinery.

By reducing toxic substances in refinery effluents, the regulations have improved the protection of fish and other marine organisms and their habitats. In addition, they have had the beneficial side effects of increasing recreational opportunities (e.g., swimming and fishing) and improving human health and the aesthetic qualities of the natural environment.

Consultations with stakeholders indicated that Canadian refineries not covered by the regulations may have a competitive advantage over those that are. Costs associated with meeting the requirements of the less stringent guidelines may be less than the costs of meeting the requirements of the regulations.

Canada's major competitor in the petroleum industry is the United States. The U.S. effluent discharge regulations are somewhat more stringent than the Canadian regulations. In this respect, Canadian refiners may enjoy a slight competitive advantage.

The Petroleum Refinery Liquid Effluent Regulations and Guidelines provide environmental protection and contribute to environmental sustainability. However, because there are no monitoring requirements for environmental impact, it is difficult to assess the overall effect on the ecosystem. Moreover, with no incentive under the regulations to improve effluent quality once the limits have been met, the regulations may inadvertently hinder further efforts toward environmental sustainability.

The review team's analysis included consideration of a number of alternatives to regulation. The following alternatives were viewed as worthy of consideration:

- Development of an Environmental Code of Practice, under the auspices of the Canadian Council of Ministers of the Environment, that would serve as a baseline national code. This code would be adopted as a minimum requirement in provincial regulations and permits. This approach would allow for regional flexibility and protect sensitive areas. Federal responsibility for fish protection would be maintained with application of the general provisions of the *Fisheries Act*.
- Replacing the current federal regulations and guidelines with new federal regulations that would apply only in areas where provincial regulations are nonexistent.

This approach would eliminate overlap. Again, the general provisions of the *Fisheries Act* would be available to ensure protection of the fisheries.

- Giving responsibility for regulating refinery's effluents to provinces and municipalities. The federal government would develop Environmental Effects Monitoring (EEM) regulations whereby the impact of each refinery's effluent on the receiving body of water would be assessed. This approach would enable better protection of the receiving body of water and allow regional flexibility. However, such regulations could be very expensive. Protection of the fisheries resource would be affected under the general provisions of the *Fisheries Act*.
- Establishing effluent charges based on pollutant loadings to receiving waters. This approach would promote a continuous reduction of pollutants with zero discharge as the ultimate goal. It is a market-based alternative that would promote the highest protection of the environment and give the petroleum refineries an excellent marketing tool. It would not, however, take into consideration the sensitivity of the receiving body of water unless ecosystem health objectives were established through EEM. The general provisions of the *Fisheries Act* would provide for protection of the fisheries.

- Improving the Accelerated Capital Cost Allowance (ACCA) program to make it applicable only to the adoption of new effective technology to further reduce pollutant discharges. In this way the ACCA program could motivate the petroleum industry to invest in the development and acquisition of best achievable technology. This approach would allow for regional flexibility, promote protection of the environment, and might help to develop a dynamic new wastewater treatment market. Again, EEM would be required to ensure sustainable ecosystem health, and the general provisions of the *Fisheries Act* would be used to ensure protection of fish.

In summary, it is evident from the external and internal viewpoints received and from the review team's analysis that changes to the regulations should be considered. From an environmental perspective, there is a continuing need for a national baseline standard for petroleum refinery effluent deposits and for controlling such effluents. At the same time, to improve the efficiency of regulating refinery effluents, the duplication with provincial regulations needs to be eliminated. Eliminating such overlap could reduce inefficiencies.

A number of alternatives were put forth for dealing with the overlap problem. It is suggested that any new or complementary approach be developed in consultation with stake-

holders including, at least, industry, provincial governments, and relevant nongovernmental organizations.

The point was made during the consultative process that the limits set by the regulations are not tied to specific environmental targets established for the receiving waters. It is therefore suggested that, in future work, acceptable ecosystem health require-

ments or targets be established. The development of such targets should also take into account the cumulative effect of effluents from other petroleum refineries and other industrial sectors, such as pulp and paper and mining, on the same receiving waters. EEM arrangements could be negotiated with the provinces and industry for this purpose.

Team Findings

1. Consideration should be given to revising these regulations. When the effluent limits are reviewed, they should be linked to environmental objectives and ecosystem health, and to the extent possible allow for site-specific requirements.
2. Arrangements should be made to harmonize federal and provincial requirements.
3. Harmonization should be addressed prior to dealing with the technical details related to the application and interpretation of the current regulations.

FUELS INFORMATION REGULATIONS NO. 1 (CRC, 1978, Vol. IV, c, 407)

Regulatory Profile

To deal with the acid rain problem and other air quality issues, it is necessary to estimate accurately the sulphur dioxide emissions from fuel combustion. An important factor in these estimates is the sulphur content of various fuels.

To gain information on the sulphur content of petroleum fuels, the Fuels Information Regulations No. 1 were introduced under the *Clean Air Act* in

1977. Amended regulations were later subsumed under the *Canadian Environmental Protection Act*.

The regulations apply to companies producing in Canada or importing into Canada more than 400 cubic metres of a fuel containing any additive other than lead or lead compounds. Information on the sulphur content of these fuels and new additives must be reported under the regulations. Quarterly sulphur reports are required annually by January 31. Reports on additives in fuels are required within 60 days of selling a cumulative total of 400 cubic metres of fuel containing

any new additive other than lead within one calendar year.

Compliance with the requirement to submit annual reports on fuel sulphur content is generally good. In the last five years, there have been four inspections, three investigations, and one warning. However, compliance with the requirement to report on new additives in fuel cannot easily be checked as it requires going to producing sites and verifying the books. Information on new additives is received but compliance has not been systematically checked. Because the purpose of these regulations is to obtain statistics and information, there has been less emphasis on enforcement and compliance than there would be with more substantive regulations.

The information on the sulphur content of fuels obtained under the regulations is required for the emissions inventory kept by Environment Canada. This information serves to meet Canada's obligations under the Canada-United States Air Quality Accord, the Federal-Provincial Acid Rain Agreements, and the United Nations Economic Council for Europe (UN-ECE) Protocol on the Reduction of SO₂ Emissions.

There are no provincial regulations similar to the Fuels Information Regulations No. 1. Statistics Canada also collects fuels information but not of this nature.

Under its *Clean Air Act*, the United States requires the reporting of

registered fuels including leaded gasoline (e.g., aviation gasoline), unleaded gasoline, #1 diesel, and #2 diesel. These reports, made quarterly, indicate the amount of fuel produced. The United States also requires the concentration of additives used in the fuels to be reported. Under another part of the *Clean Air Act*, gasoline additive manufacturers have to report the amount of additives they manufacture on an annual basis.

Stakeholder Views

Approximately 75 per cent of the petroleum-producing companies and one user organization provided written comments on the regulations.

The Canadian Petroleum Products Institute (CPPI) questioned the purpose of the regulations and the use of the information reported to Environment Canada. CPPI would like to see the regulations revoked and replaced with an alternative data collection mechanism developed as a government-industry initiative. Statistics Canada's data collection system, which gathers information relating to fuel production and consumption, was cited as a possible alternative.

Another stakeholder favoured keeping the regulations but gave no reasons. In general, internal stakeholders support the regulations, but the use of the collected data is unclear to some.

Assessment and Analysis

The regulations still serve their intended purpose of gathering informa-

tion on the sulphur content of petroleum fuels. The information is reported in accordance with the regulations' requirements and is compiled by Environment Canada to meet its Canadian and international obligations to report statistical data on sulphur dioxide emissions. In contrast, the requirement to report liquid fuel additives appears to generate information that no longer serves a useful or clear purpose. It may be information that is "nice to have but not necessary."

There is no duplication of effort or objectives with other regulations of the federal government or of other levels of government. Throughout the years, the regulations have been successfully implemented and industry appears to have experienced little difficulty and minimal cost in meeting its obligations: the information is available internally and the required reports are easily prepared. There is no cost to provincial, territorial, or municipal governments.

By providing data to support sulphur dioxide reduction initiatives, the regulations provide indirect benefits. A good information base helps in the control of sulphur dioxide emissions, which prevents associated damage to human health, vegetation, agricultural crops, watercourses, wildlife, and structures.

Since it costs industry very little to comply with the regulations, there is no negative effect on competitiveness. Moreover, competitive discrimination between domestic and

imported products is a non-issue, since the reporting requirements are simple and identical whether petroleum fuels are produced in Canada or imported into Canada. The regulations do not impose any barriers to the import or export of petroleum fuels, or to trade and investment within Canada.

Stakeholder views and the review team's analysis clearly indicate the need for an alternative mechanism to collect the data required by the regulations. An assured means of getting the information is needed.

It may be possible to enter into an agreement with Statistics Canada whereby it would coordinate the collection of all fuels information and provide the necessary data to Environment Canada. If this provided the same confidence level in getting the information as the current regulations, it would make the overall collection process more efficient.

Another, perhaps longer-term, opportunity for effective data collection may be available through the National Pollutant Release Inventory (NPRI). The NPRI, at present, does not collect fuels content information, nor does it collect emission information for sulphur dioxide. However, it could in future be an excellent one-point reporting mechanism, making overall reporting by industry more efficient.

To summarize, the Fuels Information Regulations No. 1 were introduced to collect information on the sulphur content of petroleum fuels and new

additives to fuels. Information reported under the regulations is used and will continue to be needed to meet Canada's obligations under the Canada-U.S. Air Quality Accord, the Federal-Provincial Acid Rain Agreements, and the UN-ECE Protocol on the Reduction of SO₂ Emissions. In contrast, the additives information required under the regulations appears to serve no clear or useful purpose. An assured system for reporting the

sulphur information is evidently necessary. However, in the interests of efficiency, data collection should be streamlined. Alternative ways to collect the data have been proposed and should be discussed with Statistics Canada as soon as possible. At the same time, an assured means for getting sulphur information should be examined to determine whether it can be satisfied by means other than these regulations.

Team Findings

1. The fuel additive section of these regulations should be revoked.
2. If an alternative legal requirement for providing the sulphur information (e.g., through Statistics Canada) can be secured, then the remainder of the regulations could be revoked.

GASOLINE REGULATIONS (SOR/90-247, May 9, 1990)

Regulatory Profile

Lead in most, if not all, of its chemical species and physical states is potentially toxic and hazardous to human health. The Gasoline Regulations were issued in 1990 to respond to the Government of Canada's policy of reducing blood lead concentrations to the lowest possible level. Gasoline lead was a major contributor and thus a threat to human health. The regulations essentially eliminated the use of leaded gasoline in Canada.

The Gasoline Regulations were introduced to replace the Lead-Free Gasoline Regulations and the Leaded Gasoline Regulations. The Gasoline

Regulations prescribe an average lead concentration for leaded gasoline used in engines that require a small amount of lead to avoid premature failure. They also prescribe a maximum concentration of lead for unleaded gasoline that may become contaminated through the distribution system. Moreover, since phosphorus poisons motor vehicle catalytic converters, the regulations also prescribe a maximum concentration of phosphorus for unleaded gasoline.

Producers and importers of leaded gasoline must report quarterly on the quantity of gasoline, the quantity of lead added to the gasoline, and the average lead concentration. (The requirement that each refinery report the quantity of lead contained in additives purchased, used, disposed of,

lost, or stored was repealed on October 9, 1992.) Leaded gasoline ceased to be produced in Canada shortly after the regulations came into force on December 1, 1990, but small amounts of leaded gasoline are still being imported for use in farm machinery, marine engines, and heavy-duty trucks. Therefore, industry's reporting burden is nil or very small. Since "aviation gasoline" is not included in the definition of gasoline under the Gasoline Regulations, no reports on its production in Canada are required.

The regulations were not introduced to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding.

In 1989, under the Lead-Free Gasoline and the Leaded Gasoline Regulations which preceded the Gasoline Regulations, there were some 1500 inspections, 22 investigations, and 21 warnings. The only conviction under those regulations took place in 1986.

Since the promulgation of the Gasoline Regulations in 1990, there have been 1576 inspections, 14 investigations, 7 warnings, and 5 prosecutions. In 1993, there are five cases of litigation pending. In general, there is a high level of compliance, refineries having dismantled facilities designed to add lead to gasoline.

On the international front, the United States has been regulating leaded gasoline on a progressive basis since

1973. The current allowable concentration of lead in leaded gasoline is 26 milligrams per litre. Lead in gasoline for use in off-road vehicles is not regulated. By 1996, the United States is scheduled to ban leaded gasoline except for fuel used in competition racing. Aviation gasoline is not regulated for lead content in the United States. The industry is working on developing a high-octane unleaded aviation gasoline; it should be available by 1996 and widely available by the year 2000.

In its last update (1987), the International Register of Potentially Toxic Chemicals indicated that most other industrialized countries have established a maximum concentration of lead in leaded gasoline of 150 milligrams per litre. Australia, however, allows its individual states to regulate lead in gasoline; the maximum lead concentration varies from 150 to 840 milligrams per litre. Japan banned leaded gasoline in the early 1970s.

Stakeholder Views

In September 1986, the Royal Society of Canada Commission on Lead in the Environment published a report entitled *Lead in the Canadian Environment: Science and Regulation*. The Commission's first recommendation was the reduction of blood lead concentrations to the lowest possible level. Any level of blood lead was deemed to be harmful to human health. In October 1989, another study, Environment Canada Report EPS 3/TS/1, *The Elimination of Leaded Motor Gasoline: Effect on*

Canadian Gasoline Engines Beyond 1990, found that the elimination of leaded gasoline would not be a hardship for most users.

Under the current review, comments were received from one producer and one national association representing eight producers. Two users and six user associations also made their views known on the regulations.

External stakeholders did not raise any specific issues relating to the purpose and administration of the regulations.

Certain stakeholders expressed concerns over the use of leaded gasoline by racers in motorsport events and by collectors of vintage automobiles. In fact, one stakeholder would support a government initiative to closely monitor the Canada-U.S. border to prevent the import of leaded fuel for motorsport events.

Another stakeholder would welcome the creation of an exemption in the existing regulations to permit the use of leaded gasoline by vintage automobile collectors and by racers who participate in racing series in Canada sponsored by U.S. organizations. The same stakeholder maintained that without an exemption, Canada could miss out on any economic benefits that might be generated by the various motorsport events held in Canada.

External stakeholders differed over the usefulness of the regulations. Two of them emphasized the need to maintain the regulations in order to keep

the market lead-free; another argued that the regulations were redundant, since every motor gasoline producer in Canada has removed all equipment associated with the production of leaded gasoline. None of the stakeholders suggested an alternative method of controlling the lead concentration in motor gasoline.

Two stakeholders raised issues not directly related to the regulations: first, the need to harmonize the regulatory requirements with provincial, federal, and North American standards for design, certification, manufacture, and assembly of automobiles; second, the concern over the use of methylcyclopentadienyl manganese tricarbonyl (MMT) in gasoline, which those stakeholders consider detrimental to the effectiveness of catalytic converters at high mileage.

The government's involvement in applying the regulations has decreased due to the elimination of leaded motor gasoline production facilities in Canada. Internal stakeholders are now focusing their efforts on monitoring and preventing the illegal use of highly leaded gasoline, such as aviation gasoline, in motorsport events held in Canada. Although some of the stakeholders suspect a black market exists for highly leaded gasoline, it is not readily identifiable.

Health Canada endorses the regulations and notes that annual reports of lead concentrations measured at the National Air Pollution Surveillance (NAPS) stations across Canada have

shown significant decreases in air lead levels since 1973, the year leaded gasoline use peaked.

Assessment and Analysis

The Gasoline Regulations still serve their intended purpose of virtually eliminating lead in gasoline. This in turn eliminates emissions of lead to the environment through vehicular

exhaust. There is no duplication with other federal or provincial regulations.

By limiting the production and import of leaded fuel, the Gasoline Regulations help prevent damage to human health from elevated blood lead levels, particularly the negative effects on the behaviour and mental development of children.

The industry adapted quickly in response to high consumer demand for unleaded gasoline. Compliance with the Gasoline Regulations costs refineries approximately \$500 million in new and modified facilities required to meet the demand for unleaded gasoline. All refiners in Canada chose not to produce leaded motor gasoline because of the small remaining market and eliminated their lead additive facilities. They still have lead additive facilities for aviation gasoline.

The review found that the application of the regulations does not present a barrier to trade, nor does it currently place any unnecessary or significant cost burdens on industry since the adjustment to production of unleaded gasoline has taken place.

The regulations, with the possible exception of specific cases, have had little overall impact on competitiveness either within Canada or between Canada and the United States. They apply equally to all producers and importers of fuel in Canada. The initial cost of new refinery processes required to comply is no longer a factor. The United States has similar requirements for motor gasoline.

The regulations support the Green Plan objective of limiting or eliminating the release of toxic substances to the environment, and the level of enforcement, and compliance is adequate to promote environmental sustainability. From an environmental perspective, the regulations appear to have achieved their purpose.

In summary, apart from its use in aviation, the only permitted use of leaded gasoline is in power machinery used in farming, boats, and some heavy-duty trucks. However, the use of leaded gasoline for these purposes has diminished substantially since replacement equipment is generally designed for use with lead-free gasoline.

The question of automotive racing is being resolved outside of this review exercise. An amendment to the Gasoline Regulations was proposed in *Canada Gazette* Part I that would exclude gasoline used in racing vehicles. The 60-day comment period produced 10 notices of objection requesting a board of review for the amendment. Several letters of support for the amendment were also

received. The Minister has requested more economic and technical informa-

tion before deciding on how to proceed.

Team Findings

1. The regulations should be retained.

CONTAMINATED FUEL REGULATIONS

(SOR/91-486, August 14, 1991)

Regulatory Profile

The Contaminated Fuel Regulations were introduced in 1991 to replace the Interim Order Respecting the Import and Export of Contaminated Fuel (1989). The purpose of the Interim Order was to prohibit the import and export of fuels containing hazardous wastes (especially PCBs), except for the purpose of destroying, recycling, or disposing of the fuels at an approved facility.

The Interim Order responded to reports that hazardous wastes were being secretly mixed into fuels by companies in the United States for sale in legal fuel to Canadian importers. Hazardous wastes have high disposal costs, and mixing them in with fuel for sale in Canada provided a low-cost alternative. The Contaminated Fuel Regulations were intended to protect the Canadian population and environment from potential exposure to toxic substances generated by the combustion of hazardous wastes in fuels.

The federal government enforces the regulations through random inspection

and sampling of tanker traffic crossing the Canada-U.S. border. All inspections and samples are undertaken by trained inspectors. Reporting is the responsibility of the inspectors.

The regulations were not introduced to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding. There are no similar regulations within the jurisdictions of other federal departments, and provincial and territorial governments.

Under the Interim Order Respecting the Import and Export of Contaminated Fuel (1989) and the Contaminated Fuel Regulations (1991), there have been 859 inspections, 2 investigations, and 38 warnings, all in 1989. In recent years, Environment Canada has conducted frequent border inspections to discover whether fuels contaminated with PCBs continue to be imported into Canada. Throughout these inspections, including those carried out in the past year, no PCBs were found in any analyzed samples. Therefore, there have been no reports of violations under the regulations.

The United States does not have comparable regulations. They are

able to control contaminated fuel by other means, such as "registered fuels" requirements. All additives must also be reported.

Stakeholder Views

One user and one association representing eight companies – the Canadian Petroleum Products Institute (CPPI) – commented on the regulations. CPPI indicated that the regulations serve a useful purpose in that they prevent fraudulent and criminal disposal of wastes in fuels. CPPI also felt that the regulations enhance Canadian competitiveness by precluding the illegal sale of cheap contaminated fuels, which could depress the market price for legal fuels.

This stakeholder viewed the regulations as promoting environmental sustainability, since they eliminate uncontrolled disposal options for hazardous wastes in fuel. CPPI supported the retention of the regulations and offered no alternative method of preventing and controlling the disposal of hazardous wastes in fuels. The other stakeholder expressed the opinion that the objectives of the regulations could be met through provincial waste regulations.

Three key concerns were expressed by the internal stakeholders: first, the effectiveness of the inspection process involved in monitoring the contaminants found in fuels; second, the need to create proper screening tests or analytical procedures for detecting contaminants other than

PCBs; and third, the need to review the inspection strategy.

Environment Canada's Quebec Region pointed out the possibility of combining the Contaminated Fuel Regulations with existing import and export regulations for hazardous wastes.

According to Industry Canada, the Contaminated Fuel Regulations benefit competitiveness in Canada in that they protect Canadian refiners and legitimate importers of fuels from the destabilizing effects of fraudulent activities in the marketplace. Health Canada also supported the regulations, as they prevent illegal dumping of fuels containing wastes that are harmful to human health and the environment.

Assessment and Analysis

The conditions that led to the development of the Contaminated Fuel Regulations still prevail. The disposal of hazardous wastes is expensive, and their illegal mix into fuels destined for Canada continues to be a comparatively cheap alternative. The regulations are required to prevent this activity and provide some protection from the hazards to human and environmental health associated with the combustion of hazardous wastes in fuels. Arrangements for applying the regulations have been solely a federal responsibility.

Since the original 1989 Interim Order, only positive comments have been received from industry regarding the

order and the regulations. Since there is no compliance cost to Canadian industry, the regulations have had no negative impact on competitiveness. In fact, the regulations are considered to have had a positive effect on competitiveness in that they prevent the sale of cheap alternatives to legal fuels.

With regard to the administration of the regulations, stakeholder views and

the team's analysis both indicate a need to examine current procedures and methodologies for the inspection of fuels and the detection and measurement of contaminants.

It is understood that the Petroleum Tests Methods Committee of the Canadian General Standards Board is currently attempting to identify suitable methods for detecting contaminants.

Team Findings

1. The Contaminated Fuel Regulations should be retained.
2. There is scope to improve the procedures and the methodologies related to inspection, detection, and measurement of contaminants and, thereby, the overall effectiveness of the regulations.
3. The possibility exists of combining these regulations with the Export and Import of Hazardous Wastes Regulations. This should be explored.

APPENDIX D.1

Individuals and groups who participated in consultations or provided written submissions

Producers

Canadian Petroleum Products Institute
Chevron Canada Limited
Husky Oil Operations Limited
Imperial Oil Limited
Irving Oil Limited
Novacor Chemicals (Canada) Limited
Parkland Refinery Company
Petro-Canada
Shell Canada Limited
Sunoco Inc.
Ultramar Canada Incorporated

Users

ASN Canada FIA Inc.
Association of International Automobile Manufacturers of Canada
Bombardier Inc. (Ski Doo Division)
Circuit de Courses de Motoneiges du Québec Inc.
Chrysler Canada Limited
Dean Murray Holdings Limited
Fédération Nautique du Canada
Ford Motor Company of Canada Limited
National Hot Rod Association (U.S.)
Régates Internationales de Valleyfield
Vintage Automobile Racing Association of Canada
Western Canada Motorsport Association Inc.

Environmental Nongovernmental Organizations

Environmental Law Centre

Others

AECL (Research)
Bill Klomps, Creston Farms, Bayfield, Ontario
Canadian Federation of Independent Business
Canadian Labour Congress
Nova Scotia Power
Thompson-Nicola Regional District, British Columbia
Village of Cache Creek, British Columbia

INTRODUCTION**List of Regulations**

- Chlorofluorocarbon Regulations, 1989
- Ozone-Depleting Substances Regulations No. 1
- Ozone-Depleting Substances Regulations No. 2
- Ozone-Depleting Substances Regulations No. 3
- Ozone-Depleting Substances Regulations No. 4
- Toxic Substances Export Notification Regulations
- Mirex Regulations, 1989
- Vinyl Chloride Release Regulations

Review Team

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Review Process

The review team invited interested industrial associations, companies, environmental groups, and other government departments to submit information. Individuals and groups who participated in consultations or provided written submissions are listed in Appendix E.1.

These stakeholders were asked for their views on:

- the purpose of these regulations;
- how they are administered;
- their impact on competitiveness;
- their impact on environmental sustainability;

- how they could be amended; and
- whether there are more efficient ways to achieve the objectives.

The extent of stakeholder consultation was tailored to each regulation or cluster of regulations.

Because of the complexity of the ozone protection program, five existing regulations – Chlorofluorocarbon Regulations, 1989, and the Ozone-Depleting Substances Regulations Nos. 1-4 – were dealt with as a group. The team analyzed the other regulations individually, using the established review criteria.

OZONE-DEPLETING SUBSTANCES REGULATIONS

No. 1 (SOR/89-351, June 29, 1989)
 No. 2 (SOR/90-583, Aug. 28, 1990)
 No. 3 (SOR/90-584, Aug. 28, 1990)
 No. 4 (SOR/93-218, April 27, 1993)
Chlorofluorocarbon Regulations, 1989
 (SOR/90-127, February 15, 1990)

Regulatory Profile

Environment Canada regulates four types of ozone-depleting substances – chlorofluorocarbons (CFCs), halons, methyl chloroform, and carbon tetrachloride – pursuant to section 34 of the *Canadian Environmental Protection Act* (CEPA). The purpose of these regulations is to reduce and eventually eliminate emissions of ozone-depleting substances (ODS).

In 1985, the Vienna Convention established a framework to protect the earth's upper atmosphere through

cooperative international efforts on scientific research and information exchange. Canada signed the Convention in 1985 and was the first nation to formally ratify it in June 1986.

Canada played a key role in the development of the Montreal Protocol on Substances that Deplete the Ozone Layer. That agreement was developed under the United Nations Environment Program (UNEP) and marked the culmination of more than five years of intensive international negotiations. In 1986, a Canadian proposal broke a serious deadlock and paved the way for the development of the final accord. As of March 31, 1993, 106 countries have signed it.

Canada's ODS regulations allow it to comply with its commitments under the Montreal Protocol. These are the regulations that control the use, production, import, and export of ozone-depleting substances in Canada:

- The CFC Regulations, 1989 were designed to eliminate the use of CFCs in hairsprays, deodorants, and antiperspirants. They were originally promulgated in 1980 under the *Environmental Contaminants Act* and later transferred to CEPA.
- ODS Regulations Nos. 1 and 2 were designed to control Canada's production and import of CFCs and halons as set out in the original version of the Montreal Protocol.

- ODS Regulations No. 3 prohibit the use of food packaging material made of plastic foam in which CFCs have been used as foaming agent. They also prohibit pressurized CFC containers of ten kilograms or less.
- ODS Regulations No. 4 add methyl chloroform and carbon tetrachloride to the list of controlled substances. They implement the provisions of the London Amendment to the Montreal Protocol.

There are no reporting requirements under the CFC Regulations, 1989 or ODS Regulations No. 3; ODS Regulations Nos. 1, 2, and 4 require producers to complete quarterly reports on their production, imports, and exports of controlled substances. Producers and importers are also required to maintain records with dates proving the accuracy of the reports.

In 1990, the Canadian Council of Ministers of the Environment agreed on federal and provincial responsibilities for controlling ODS. Federal regulations address the import, manufacture, and export of ODS and of products containing ODS. Provincial and territorial regulations address recovery and recycling requirements, as well as venting and releases and the uses of ODS and products containing ODS.

As of May 1993, the provinces of New Brunswick, Nova Scotia, Ontario, Manitoba, Quebec, and British Colum-

bia had promulgated regulations and the provinces of Saskatchewan and Alberta and the Yukon Territorial Government had published draft regulations. As well, some municipalities and urban communities have adopted CFC recovery and recycling bylaws.

A federal-provincial working group on control harmonization for ODS was established under CEPA in 1989. Chaired by Environment Canada, it meets regularly to discuss issues and review control actions. The cities of Toronto and Montreal, the Canadian Federation of Municipalities, the Northwest Territories, and Yukon are also members.

In total, there were 491 inspections carried out during a four-year period (1989-92) for ODS Regulations Nos. 1, 2, and 4.

Stakeholder Views

Recent Reviews

The ODS regulations were developed in consultation with stakeholders from industry, environmental groups, and federal government departments. The last series of consultation meetings on the Canadian ozone protection program was held June 1-4, 1992, with more than 300 people attending. Stakeholders' comments related to competitiveness were as follows:

- It would be easier for companies that operate in several provinces if provincial regulations were harmonized.

- Administration costs for complying with regulations are low, giving Canadian industry an advantage.
- Program requirements should be similar to those in the United States, so that Canadian industry is not put at a disadvantage.
- Imported products should be treated the same way as domestic products, so that Canadian companies are not put at a disadvantage domestically.
- The industry opposes alternatives to current controls, such as a tax on ODS, not necessarily because of the extra cost of the products, but because of the added administrative burden of collecting the tax. Other countries, notably the United States have implemented an incremental tax for CFCs and halons.

Current Review

More than 750 stakeholders interested in or affected by the ODS regulations were notified of Environment Canada's regulatory review. Environment Canada also gave a detailed information package on the regulations to ten industry associations, two environmental groups, four of the biggest ODS producers and importers, and four federal departments. These stakeholders were asked to provide written submissions, and 24 responded. The Canadian Council of Ministers of the Environment was briefed.

The most common concern related to the need for harmonization among provincial regulations. The importance of harmonizing Canadian regulations with United States regulations was highlighted by industry. There were a number of recommendations to amalgamate all the ODS regulations.

Some stakeholders questioned the need for the federal government to regulate both the use and supply side for CFCs. Others confirmed the obsolescence of the *Chlorofluorocarbon Regulations, 1989*. A few administrative concerns were also reported.

Other comments related to:

- collecting data from ODS users, while regulations apply to suppliers;
- costs of changing production to a nonCFC alternative;
- uncertainty and time costs for industry of ministerial approval for certain provisions of the regulations;
- need to have all regulations and schedules in one document along with a document explaining the regulations in "plain language";
- costs and problems of having to phase out CFCs while increasing energy efficiency, since some CFC alternatives are not as energy-efficient;

- need for labelling requirements;
- need for a program similar to the U.S. Significant New Alliance Policy (SNAP) program to identify acceptable alternatives and ban unacceptable ones; and
- need for fostering the development of recovery and recycling facilities and new alternatives.

Stakeholders also commented on the positive effect on environmental sustainability of the ODS program.

Assessment and Analysis

In general, implementing the Montreal Protocol requirements should not affect Canada's competitiveness since 105 other countries have to meet the same requirements. Each country has a different approach to the requirements. The review team found that the advantages of Canada's approach outweigh the disadvantages.

No cost data are available for the CFC Regulations, 1989 as their promulgation dates back to 1980.

The costs to industry for complying with ODS Regulations No. 1 were estimated to be between \$0.2 and \$1.9 billion (1989 dollars); benefits were estimated at between \$2.9 and \$25.9 billion (depending on the assumptions used) from reducing the number of skin cancer cases.

Compliance costs to industry for ODS Regulations No. 2 were estimated to be between \$22 and \$303 million

(1989 dollars); benefits were estimated at between \$0.3 and \$2.9 billion from reducing the number of skin cancer cases.

ODS Regulations No. 3 cost consumers between \$0.6 and \$1.5 million in 1989; benefits were not estimated.

ODS Regulations No. 4 cost industry between \$249.6 and \$434.1 million (1992 dollars); benefits were identified but not quantified.

Some companies have also used less expensive alternatives to ODS and thus have saved some money.

Implementation costs for industry were significant, although administrative costs such as reporting and record keeping are not. When quantified, estimated benefits were greater than compliance costs although the benefits will be realized over a longer term.

Countries cannot afford to ignore depletion of the ozone layer. The more the ozone layer is depleted, the greater the increase in ground-level ultraviolet (UV-B) radiation. There is also a contribution to global climatic changes such as the greenhouse effect. UV-B radiation also upsets the ecological balance of aquatic ecosystems, which could eventually harm the entire food chain. It also creates air quality problems.

Canada's ozone protection program contributes to environmental sustainability worldwide. The program's

open consultation process also ensures that stakeholders help choose the most effective solutions, creating a climate of certainty for industry.

The objectives set out in the Montreal Protocol are long term. It takes three to five years on average for a molecule of an ODS to reach the stratosphere after its release into the atmosphere. Some of these chemicals will be destroying ozone for 100 years. Computer models predict that maximum ozone layer depletion will be encountered around the year 2000. The impacts of the measures taken in the last decade will then start to be felt and ozone depletion will be reversed.

It is always difficult to quantify environmental benefits. However, the international community believes that benefits resulting from the actions taken under the Montreal Protocol will significantly exceed the costs.

What can be measured at this time is the reduction in consumption of ODS. Data show that by June 1992, Canada had already reduced its ODS consumption (production + imports - exports) by 58 per cent compared with 1986 levels.

The program also contributes to environmental sustainability. ODS Regulations Nos. 1, 2 and 4 indirectly reduce pollution by promoting reduction, re-use, and recycling approaches so that the industry stays within production and import caps.

Some of the ODS regulations overlap. For example, CFC Regulations, 1989

and ODS Regulations No. 3 reach the same objective since the substances covered under ODS Regulations No. 3 include CFCs. The revocation of CFC Regulations, 1989 is already being contemplated.

There are plans to combine and revise ODS Regulations Nos. 1, 2, and 4 in one set of regulations, since the ODS phase-out dates do not reflect revised Montreal Protocol requirements adopted in November 1992.

Environment Canada has held regular consultations with industry stakeholders to identify their concerns and find the most efficient ways to reach the federal ozone protection program objectives. Stakeholders have expressed satisfaction with the level of consultations.

The current federal regulations have created as much certainty and consistency as possible as to how ODS are to be phased out in Canada. More flexibility has been introduced in the provisions of ODS Regulations No. 4 to help industry without compromising program objectives.

Industry considers the reporting requirements under the ODS regulations to be minimal. User data need to be collected to predict the potential impact of the regulations and identify potential problems with finding ODS substitutes.

Stakeholders across the board are concerned about the level of harmonization among provincial regulations. They say different provincial

requirements create an administrative burden and generally do not provide significant environmental benefits.

A federal-provincial working group on control harmonization for ODS, established under CEPA in 1989, has worked to minimize these inconsistencies and overlaps. Nevertheless, Canadian governments should make greater efforts to address the existing differences.

Canada should remain internationally competitive despite implementation of the Montreal Protocol requirements since most ODS-producing countries are facing the same requirements. In fact, not implementing the Montreal Protocol requirements would decrease Canada's competitiveness – countries not party to the Protocol face trade restrictions on the import and export of ODS and products containing ODS from countries that are parties.

Current regulations are also consistent with provisions of the General Agreement on Tariffs and Trade (GATT).

The ozone protection program is part of the Green Plan Global Integrity initiative. No country can take advantage of the situation to make short-term gains at the expense of the environment. As proof of the effects

of global reduction of ODS, the rate of increase of concentrations of CFC 11 and CFC 12 in the lower atmosphere has started to slow down in the northern hemisphere in recent years.

Environment Canada also tries to prevent the regulations from causing domestic economic disruption by consulting with industry to create a climate of certainty. The program is based on an international scientific consensus.

The review looked at a range of alternatives addressing all stages of the life cycle of ODS: the production of new ODS, emissions of existing ODS, and their uses in products. These alternatives include taxation, research incentives, promoting voluntary actions, market-based controls, prohibitions, emission standards, procedural standards, product labeling, and education programs.

However, the review found that the current approach – annual allocations to producers and importers – is the most effective because it allows for market flexibility while providing international assurances that Canada is delivering on its commitments. Public education and voluntary action are not sufficient by themselves but should be pursued with other controls.

Team Findings

1. The ODS regulations do not impede Canada's competitiveness.
2. Costs incurred by industry and ODS consumers are significant, but long-term benefits are greater.

3. Increased harmonization is needed among provincial regulations.
4. The possibility of establishing administrative or equivalency agreements with the provinces should be explored to deal with any federal-provincial overlap.
5. The proposed amendments to ODS Regulations No. 3 should be dropped, except the one prohibiting certain trade with nonparties as this is required by the Montreal Protocol. Many provinces have already adopted controls on the uses that the federal government is considering regulating. Industry has acted voluntarily for some of these uses.
6. ODS Regulations Nos. 1, 2, and 4 should be combined into one regulation as planned.
7. The CFC Regulations, 1989 should be revoked as they have become redundant.
8. The current approach for controls over production and import of ODS should be continued.
9. Public education and voluntary action should be pursued with other controls.
10. Environment Canada should continue to consult stakeholders at all stages of developing ODS regulations.
11. Certain administrative concerns raised by industry will be addressed through the amalgamation of ODS regulations Nos. 1, 2 and 4. Others can be addressed through on-going dialogue and other means.

**TOXIC SUBSTANCES EXPORT
NOTIFICATION REGULATIONS**
(SOR/92-634, November 12, 1992)

Regulatory Profile

The Toxic Substances Export Notification Regulations were promulgated in 1992 pursuant to subsection 45(3) of CEPA to fulfil Canada's commitment to the London Guidelines for the Ex-

change of Information on Chemicals in International Trade issued by UNEP.

These regulations are designed to help governments enhance environmental security through information exchange related to the international trade of toxic substances. During the past 50 years, there has been a staggering increase in the manufacture and consumption of chemicals. Chemical

literature now describes more than three million individual compounds, and the list keeps growing. Moreover, commercial mixtures contain from two to thousands of individual compounds, some of which have not been isolated in pure form.

Some substances banned or severely restricted in certain countries are being traded internationally. Serious and costly health and environmental problems could result if countries do not know about the risks associated with the use of substances they are importing. Giving importing nations scientific, technical, and legal information about these substances helps them determine their need for regulatory or other controls.

In Canada, toxic substances whose uses are substantially restricted are placed on the List of Substances Requiring Export Notification in Part II of Schedule II of CEPA. A notice is required when a company wishes to export a substance on the list for the first time after it has been added to the list, or after any regulatory action is taken by Canada imposing further restrictions on the substance, or after publication in the *Canada Gazette* of an action to restrict imports taken by the country of destination. The exporter has to give the importing country a summary of why and how the substance is controlled in the exporting country and a contact name for more information.

The London Guidelines for the Exchange of Information on Chemicals in International Trade include the Prior

Informed Consent (PIC) amendment from 1989, which allows importing countries to decide whether they want to receive substances that other countries have banned or severely restricted.

Canada's Toxic Substances Export Notification Regulations do not reflect the PIC amendment, but Environment Canada and exporters are developing a voluntary procedure to implement PIC. Other countries, however, may insist that Canada have a regulation.

Environment Canada monitors exporters in Canada. Company records can be audited to verify compliance. Shipments from one country to another passing through Canada are not subject to the regulations until they are ready for export. However, goods imported for re-export are monitored for compliance. Environment Canada monitors the notifications, but there had not been any inspections as of April 1993.

Stakeholder Views

The review team notified stakeholders of the regulatory review. It also invited five associations likely to export or use toxic substances, two environmental groups, the Crop Protection Institute, and two federal departments to submit comments. Stakeholder comments dealt with administrative procedures.

Assessment and Analysis

Few firms in Canada export substances subject to these regulations.

The regulations were published recently – December 1992 – so there are few compliance costs to date. The Regulatory Impact Analysis Statement that accompanied the regulations estimates that exporters will pay about \$55 per substance exported for the first time. About 50 substances could be subject to the system each year, amounting to annual costs to industry of about \$2750.

The regulations will particularly benefit developing countries, but Canada will likely also benefit by receiving useful information about characteristics and composition of toxic substances and safety information. Around the world, it will be easier to protect the environment and human health because of easier access to information on toxic substances.

These regulations will help the Green Plan achieve its goal of global environmental security because they will ensure distribution of knowledge about storage, shipment, and handling of toxic substances. This will contribute to environmental sustainability. The federal government has sole

responsibility for international trade, so there is no overlap with provincial regulations.

These regulations are neutral in respect of Canada's competitiveness since Canada's major trading partners also use the UNEP guidelines. These regulations cause no prejudice of any kind to control supply, price, entry to, or exit from various markets. They will have no effect on interprovincial or international trade.

The review identified three alternatives to the existing regulations. Environment Canada could regulate reporting requirements (i.e., status quo); assume responsibility for information exchange with other governments; or switch to voluntary compliance.

Environment Canada is looking at voluntary approaches with industry to implement Canada's commitments under the 1989 amendments to the UNEP agreement. The voluntary approach would be flexible, but regulations may still be required to ensure that Canada's approach is accepted by other countries.

Team Findings

1. These regulations should be retained.
2. If the 1989 Prior Informed Consent (PIC) amendments to the UNEP London Guidelines are successfully implemented by industry voluntarily, there may not be a need to regulate PIC. Nevertheless, the Toxic Substances Export Notification Regulations would continue to be required.

MIREX REGULATIONS, 1989 (SOR/90-126, November 23, 1978)

Regulatory Profile

The Mirex Regulations, 1989 were originally promulgated in 1978 under the *Environmental Contaminants Act*. They were transferred to subsection 34(1) of CEPA in 1990. Mirex is a cyclodiene contact insecticide, but it has had other uses. It was used extensively for 15 years in the southern United States to help eradicate fire ants. Its main use in Canada was as a fire retardant in plastics or other polymer formulations under the name "dechlorane." It was also used as a pyrotechnic to make white smoke.

The objective of the regulations is to prevent entry of Mirex into the Canadian ecosystem. Mirex has never been permitted for use in Canadian agriculture.

Single doses of Mirex are moderately acutely toxic in laboratory animals. However, it is persistent and tends to bioaccumulate, as do many other organochlorine substances such as polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethane (DDT). Thus Mirex is a serious environmental threat.

In experiments with model freshwater ecosystems, Mirex was found to be one of the most stable compounds ever evaluated. It is extremely persistent in the environment.

Mirex can accumulate in living tissues. In experiments with aquatic

organisms, all species at all trophic levels have been found to accumulate this substance, particularly in fatty tissues.

Mirex now permeates the entire food chain in the Lake Ontario-St. Lawrence River-Gulf of St. Lawrence ecosystem. Mirex has been found in the sediments of the Laurentian Trough, some 1500 kilometres downstream from its major source in the Niagara River. Mirex has also been detected in marine mammals and migrating waterfowl at the Grand Banks, Newfoundland. The main route of exposure to residents of the Lake Ontario basin is from the consumption of Lake Ontario fish. It is unlikely, though, that current levels of Mirex in the Great Lakes are a risk to human health if fish consumption advisories are followed. Mirex is only rarely detected in drinking water samples taken from the Great Lakes.

The Mirex Regulations, 1989 prohibit the import, manufacture, processing, offer for sale, or use of Mirex for any commercial, manufacturing, or processing purpose. There are no reporting requirements.

Mirex has been banned in Canada, the United States, and a host of other countries over the years.

Current concerns in Canada and the United States relate to the leaching of Mirex from U.S. dump sites into the Great Lakes. Mirex is one of the contaminants being studied by the Niagara River Toxics Committee (NRTC), which has representatives

from Environment Canada, the Ontario Ministry of the Environment, the U.S. Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation.

It is also one of the 18 persistent toxic chemicals to be studied under the Lake Ontario Toxics Management Plan. This plan has been developed following a 1987 agreement between the members of the NRTC.

Environment Canada periodically conducts literature searches to determine whether Mirex is still being used anywhere in the world. There are no listings of manufacturers or sellers of Mirex, and scans of recently granted patents have not turned up evidence of the substance being used in new products. Consequently, Environment Canada has not had any reason to conduct inspections.

Stakeholder Views

The review team invited five associations, the Crop Protection Institute, the International Joint Commission (IJC), Agriculture Canada, Health Canada, and two environmental groups to provide submissions. Outside of government and the IJC, Environment Canada received no replies.

There was general support to maintain these regulations because of the toxicity of Mirex and its persistence in ecosystems. The ban is needed to prevent new sources of entry into the environment and to demonstrate

Environment Canada's commitment to eliminate toxic and persistent chemicals from the Canadian environment. Two stakeholders commented that the regulations are no longer required since there does not appear to be a demand for Mirex in Canada.

Assessment and Analysis

Even though this substance has been banned in Canada and the United States since the late 1970s, it continues to damage the environment. Mirex is still entering Canada from U.S. dump sites along the Niagara River. This problem is being addressed through bilateral cooperation.

Some estimates suggest that it may be almost 100 years before Mirex-contaminated sediments in Lake Ontario are covered up by "clean" sediments. The benefits of this ban will gradually increase over the long term. The ban of Mirex supports Green Plan objectives of clean air, water, and land, and of maintaining the ecological integrity of species. The regulations contribute to environmental sustainability. However, the regulations cannot stop Mirex from entering Canadian ecosystems from U.S. sources.

The review found that the regulatory objective to prevent further Mirex contamination of the Canadian ecosystem from Canadian sources is still valid.

The compliance costs associated with these regulations are negligible. More effective substitutes for Mirex have been in use for many years. Since

Mirex was never produced in Canada, there has been no cost to producers as a result of the ban.

The ban on Mirex has no effect on competitiveness. There are no essential uses for the substance in Canada. The ban has no effect on interprovincial trade; nor does it affect international trade since its use is banned in

the United States and many other countries.

Concerning alternatives, the review team looked at regulations requiring zero discharge, a voluntary ban, and a ban only on agricultural uses. The present regulations were found to be the best option.

Team Findings

1. These regulations should be retained.
2. There is a need for continued government efforts to monitor the levels of Mirex in the Lake Ontario-St. Lawrence ecosystem. Monitoring may show that further action is required to deal with Mirex leaching from U.S. dump sites.

VINYL CHLORIDE RELEASE REGULATIONS, 1992

(SOR/92-631, April 11, 1979)

Regulatory Profile

The Vinyl Chloride Release Regulations were first promulgated under the *Clean Air Act* in 1979 and subsequently rolled into CEPA. They were amended in 1992 to improve practices for the prevention and minimization of losses and to enhance the reporting process. Vinyl chloride is on Schedule I of CEPA - Toxic Substances.

Vinyl chloride, a carcinogen, has been linked to a rare form of fatal liver cancer in some workers exposed to high levels of the chemical. As well, epidemiological studies found ex-

cessive birth defects, stillbirths, and miscarriages in the vicinity of vinyl chloride plants. The regulations aim to continuously reduce the release of vinyl chloride from vinyl chloride and polyvinyl chloride manufacturing plants through prevention and minimization of losses.

The regulations limit the release into the ambient air of vinyl chloride. They state the maximum concentrations or quantities that may be emitted from stationary sources. The regulations include requirements to submit quarterly reports, report on unauthorized releases, and compliance reports. In addition, an annual compliance test and plans for the control of fugitive emissions and for the prevention of accidental releases are required.

During the past four fiscal years, Environment Canada has carried out 50 inspections and one investigation; two warning letters and two inspector directions were issued.

Stakeholder Views

Recent Reviews

The regulations were amended in 1992 – a process that involved extensive consultation with the provinces, industry, environmental groups, and the public. The regulatory agencies of both provinces where plants are located (Alberta and Ontario) helped with the technical aspects of the revised regulations as they were being developed.

Current Review

In addition to the broad general notification of Environment Canada's regulatory review, the review team invited the three companies operating plants in Ontario and Alberta, the three municipalities involved, three environmental groups, and two environmental law associations to submit their views. The provincial regulatory agencies were informed through the Canadian Council of Ministers of the Environment. The team received comments from the three companies, a bank, and Environment Canada headquarters and regional offices.

One stakeholder expressed concern with overlap between federal and provincial regulations, particularly in Alberta. One company said Environ-

ment Canada should reconsider the need for federal regulations because design and operational improvements to vinyl chloride manufacturing facilities have minimized the safety and occupational health risks as well as risks to the public at large. The company added that provincial regulations achieve the desired regulatory objectives. It recommended that there be a single level of responsibility for the administration and enforcement of regulations or that the provincial and federal regulations be harmonized.

A bank expressed the opinion that the regulations are an example of standards and performance requirements that provide clear expectations and are easy to use. It said that provinces could have equivalent regulations, but federal regulations should be dominant so that provinces could not use environmental regulations as a way to develop a competitive advantage.

One stakeholder was also concerned about the cost and effectiveness of command and control regulations. The company believes a voluntary system based on discussion, negotiation, and innovation would be more effective. It said that a number of elements of the 1992 amendments had the net effect of diverting resources into reporting and bureaucracy and away from investment in environmental control and improvements.

The stakeholder was also concerned that the annual compliance testing

puts Canadian industry at a competitive disadvantage with U.S. industry, which has to go through the testing process only when equipment is commissioned.

Assessment and Analysis

Vinyl chloride is a carcinogen – most cases of cancer reported were linked to occupational exposure to high concentrations of the substance. However, a higher incidence of birth defects in the vicinity of vinyl chloride plants was reported in the mid-1970s, so the public also needs to be protected from exposure. The regulations are needed to ensure there is a continuous reduction in the release of vinyl chloride.

The regulations provide the public and workers with considerable protection. Emissions have been reduced; so has exposure. In the early 1980s, accidental releases amounted up to 50 tonnes per year; they have ranged from 1.4 to 12.5 tonnes per year for the past four years. Industry may also benefit from these reductions with reduced enforcement activity and better public image.

Industry has not estimated current costs of complying with the regulations. However, companies incurred capital costs for reducing vinyl chloride emissions mainly in the late 1970s and early 1980s.

Present costs include equipment maintenance, routine inspections, and administration, which are not con-

sidered to be significant. However, industry is irritated by the reporting and documentation requirements for certain situations, which it sees as detracting from work on environmental control and improvement. On the other hand, Environment Canada staff believe full enforcement of the regulations results in measurable decreases in vinyl chloride releases and incidents.

The federal regulations duplicate some but not all of the requirements of some of the provincial regulations. It may be possible to establish an equivalency agreement with Alberta, as it is planning to rewrite its regulations to match the federal ones. Ontario uses a different approach and relies on interim standards. Federal regulations continue to be required.

An overall analysis indicates that the Vinyl Chloride Release Regulations do not put the Canadian industry at a competitive disadvantage with U.S. industry.

Canadian regulations are more stringent in some instances and less so in others. Canadian industry faces an annual compliance test, but U.S. companies have an annual performance test for fugitive emissions.

The regulations contribute to environmental sustainability by supporting the Green Plan objective for clean air. They promote wise use of resources by encouraging recovery of resources and reduction of losses.

Furthermore, the publication of industry performance and compliance data encourages continuous improvement.

The recent amendments to the regulations may also contribute to environmental sustainability. Environment Canada is now gathering information on the total quantities of vinyl chloride released – not just the concentrations. This will help orient future changes to the limits, if needed.

The review team examined in detail alternatives such as performance standard regulations, periodic review and publication of performance, taxation on releases, and structured and unstructured voluntary action. The team found that the present regulations – a combination of performance standards and periodic review and publication of performance – seem to be the most effective type of regulations.

Team Findings

1. No changes to the existing regulations are recommended at this time.
2. After three years of new data on quantities released have been gathered, the data should be assessed to determine whether the regulatory requirements are focusing on the right areas and whether further improvements should be made.
3. Environment Canada should continue to pursue administrative and/or equivalency agreements with the provinces of Alberta and Ontario after ensuring that all important aspects of the current regulations will be addressed.
4. Environment Canada should continue to review options of measurement for determining compliance other than an annual compliance test. Additionally, Environment Canada should review the issue of averaging the results of batch and continuous stripping operations.

APPENDIX E.1

Individuals and groups who participated in consultations or provided written submissions

OZONE-DEPLETING SUBSTANCES REGULATIONS

Companies/Industrial Associations

Association of International Automobile Manufacturers of Canada
Canadian Appliance Manufacturers Association
Canadian Flexible Foam Manufacturers Association
Cornwall Chemicals Limited
Cyanamid Canada Inc.
Dow Chemical Canada Inc.
Du Pont Canada Inc.
Ford Motor Company of Canada Limited
General Motors of Canada Limited
Halozone Recycling Inc.
Heating, Refrigeration and Air Conditioning
Institute of Canada
ICI Product Marketing Group
ICI Canada Inc.
Icynene Inc.
Ontario Hydro
Phenolic Foam Insulation Manufacturers' Association

Provincial/Municipal Governments

British Columbia Ministry of Environment, Lands and Parks
Department of Public Health, City of Toronto

Individuals

Mrs. K.W. Chambers, Pinawa, Manitoba

Environmental/Interest Groups

Federation of Canadian Municipalities
West Coast Environmental Law Association

Environment Canada

Atlantic Region
Quebec Region
Western and Northern Region

TOXIC SUBSTANCES EXPORT NOTIFICATION REGULATIONS

Companies

Cornwall Chemicals Limited
Du Pont Canada Inc.

Other Government Departments

Agriculture Canada
Health Canada

Environment Canada

Pacific and Yukon Region
Atlantic Region
Western and Northern Region
Ontario Region

MIREX REGULATIONS, 1989

Other Government Departments/Agencies

Health Canada
International Joint Commission

Environment Canada

Pacific and Yukon Region
Atlantic Region
Quebec Region
Western and Northern Region
National Water Research Institute

VINYL CHLORIDE RELEASE REGULATIONS

Companies

B.F. Goodrich Canada Inc.
Canadian Imperial Bank of Commerce
Dow Chemical Canada Inc.
Imperial Oil Chemicals Division

Other Government Departments

Health Canada

Environment Canada

Ontario Region
Western and Northern Region

INTRODUCTION**List of Regulations**

- Weather Modification Information Regulations
- International River Improvements Regulations
- Ocean Dumping Regulations
- Phosphorus Concentration Regulations
- Meat and Poultry Products Plant Liquid Effluent Regulations
- Potato Processing Plant Liquid Effluent Regulations

Review Team

Frank Quinn (Chairperson)
Economics and Conservation Branch
Environment Canada

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Atmospheric Environment Service
Environment Canada

Larry Booth
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Environment Canada

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Office of Waste Management
Environment Canada

Peter Harris
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Eon Park/Raimo Kallio
Economics and Conservation Branch
Environment Canada

James Haskill
Industrial Program Branch
Environment Canada

Richard Poersch
Atmospheric Environment Service
Environment Canada

John Jaworski
Biotechnology Directorate
Industry Canada

Dana Vindasius
Economics and Conservation Branch
Environment Canada

Review Process

The team considered six regulations under four pieces of legislation. Aside from the two food processing plant regulations, each is quite different

from the others, with different stakeholders and technical experts.

There are, nonetheless, some common threads by which they can be characterized as a group. For one

thing, they are all more than 15 years old, which means that they were developed under circumstances and among options that may have been more compelling then than now.

For another, they all focus on water in one form or another. The subject areas of the regulations range across the hydrologic cycle, from the atmosphere through rivers to the sea, and address pollution from various sources.

The order of presentation of these regulations corresponds not only with this cycle but with the gradation of influence they have on competitiveness, from less direct (weather modification, international rivers, and ocean dumping) to more direct (detergent manufacturers, and meat and poultry, and potato processing plants).

The review team consisted of officials, mostly from Environment Canada with technical, socio-economic, and policy experience. To assist their analysis, they invited comments from industry and industrial

associations, environmental groups, researchers, other government departments, and regional offices of Environment Canada.

Stakeholders were asked for their views on the purpose and administration of the regulations, impacts on competitiveness and on environmental sustainability, and whether there are better ways of achieving the objectives of the regulations. The response rate from external stakeholders was low in most cases. The team assessed each regulation according to criteria that had been developed by the Department.

In consultation with departmental staff, industry associations, and umbrella environmental organizations, a list of 125 stakeholders was developed. They are broken down by regulation and interest group in Table 9.1.

Written submissions were invited from these external stakeholders; 20 responses were received. A synopsis of the responses was provided to stakeholders to confirm that their views were accurately recorded. In-

TABLE 9.1 - STAKEHOLDER CONSULTATION PLAN

REGULATION	INDUSTRY	ENGO	OGD	PROV/MUNIC	TOTAL
Weather modification	7	9	2	15	33
International rivers	6	4	1	4	15
Ocean dumping	6	5	3	1	15
Phosphorus concentration	18	4	2	-	24
Meat & poultry products	20	4	1	-	25
Potato processing plants	10	2	1	-	13

ENGO: Environmental nongovernmental organization OGD: Other government department

ternal consultations with the Department's headquarters and regional offices also produced key information, mainly in the area of data and regulatory experience. Individuals and groups who participated in consultations or provided written submissions are listed in Appendix F.1.

WEATHER MODIFICATION INFORMATION REGULATIONS

(C.R.C. 1978, Vol. XVIII, C-1604)

Regulatory Profile

The need for legislation to control weather modification projects was debated for two decades in Canada before Parliament passed the *Weather Modification Information Act* (WMIA) in 1971 and proclaimed it with regulations in 1974. In the meantime, regional conflict and litigation had developed between commercial interests and concerned citizens over possible impacts of weather modification operations. There was no consensus, and it was unclear whether modification activities were detrimental to people or property. At the same time, scientists wanted to evaluate the merits of modification techniques in terms of cost and effectiveness.

The Weather Modification Information Regulations (WMIR) require weather modifiers to disclose information to the Assistant Deputy Minister of the Atmospheric Environment Service, Environment Canada, on the location, duration, and extent of their operations, on materials dispersed in the atmosphere, on results anticipated, and on the qualifications of operators.

Weather modifiers are required to file an intention at least ten days in advance of proposed activities and afterward to submit a daily record of activities and observations. Failure to do so can result in the imposition of a fine not exceeding \$1000 or imprisonment for not more than six months. Information made available under the regulations may be made public.

As a member of the World Meteorological Organization (WMO), Canada fulfils the requirements of the WMO registry by summarizing information gathered under the Act and regulations. In addition, Canada and the United States formally agreed in 1975 to exchange information on weather modification activities within 200 miles of the international border. The agreement remains in effect, and Canadian information is provided from data filed under the Weather Modification Information Regulations.

No prosecutions have been initiated under the Act, but several operators have been warned when they missed the ten-day notice period; they then either complied or abandoned their plans. There has been little modification activity since the Alberta Research Council terminated cloud-seeding experiments in the mid-1980s, but a resumption of operations in western Canada is anticipated in the near future.

Stakeholder Views

A total of 33 external stakeholders, including operators, provincial governments, research councils, and

university scientists were asked to provide information and views on the WMIA and its regulations. Those who responded supported the regulations either with no changes or with minor amendments. Suggested minor amendments consisted of extending the period between filing of intention and proceeding with modification activities, and updating the regulations to include reference to environmental impact assessment. All of the external stakeholders who responded agreed that the regulations are neutral in terms of competitiveness and positive in terms of environmental sustainability. None suggested alternatives to regulation.

Consultations proceeded also within the Atmospheric Environment Service (AES). Most AES scientists supported the regulations without proposing any changes. A minority suggested strengthening the legislation to require environmental impact assessment.

Assessment and Analysis

Among the provinces, British Columbia and Quebec license weather modification activities. Alberta is the only other province to pass legislation in this area; it is limited to reviewing weather modification activities through an interim board established for that purpose. Some other provinces have ad hoc committees for review purposes; most rely on the WMIA and its regulations to guide their assessments. There has been no conflict between federal and provincial regulations.

The filing of information under the regulations is at minimal cost to industry. It is difficult to generalize to what extent gathering information to comply with the regulations involves additional cost, since normal operations require much of the same information (e.g., for the Ministry of Transport under the *Aeronautics Act*).

Weather modifiers, as well as the scientific community, benefit from information gathered, gaining further knowledge of how to conduct modification projects more effectively. Moreover, centralized information gathering can be efficient in reducing research costs in this developing field.

The public benefits from greater access to information, which may alleviate unfounded fears, or which on occasion may allow the public to hold an operator accountable for liability incurred due to unanticipated weather effects in or near a project area.

The WMIA and its regulations do not impose any barriers to competitiveness for industry; anyone can carry out a weather modification project. Operators from other countries can carry out weather modification projects in Canada, as long as they meet the filing time frames. Regulations are no more stringent than regulations in other countries, except that Canada requires more information to be filed in advance.

Adopting a nonregulatory alternative may present difficulties. There is no association of weather modifiers in

Canada with which to negotiate a voluntary arrangement. Moreover, experience indicates that some modifiers are unwilling to provide information on their operations unless required by law. It would also be inconsistent for Canada to be relaxing its vigilance on weather modification at the same time that it is contributing substantially to global accords and research on climate change.

Economic instruments were considered as a means of recovering government costs in administering the regulations and monitoring atmospheric effects of modification. A tax on chemicals could be imposed, but all modifiers do not use the same chemicals, and some may not use chemicals at all. Application fees and user charges would be unlikely to contribute to cost recovery because of the paucity of applications. Nor is it the intent of the government to change the behaviour of weather modifiers by applying high fees, since their activities are not necessarily undesirable. Leaving this sphere of activity for the provincial governments to regulate is not a viable option; only

two provinces currently license weather modifiers, and some activities are likely to have transboundary effects. No friction has been reported between federal and provincial agencies with regard to sharing information on modification activities.

At some future date, it may be advisable to strengthen the WMIA and its regulations, possibly by requiring weather modifiers to obtain a licence from the Minister of the Environment. Such an amendment may bring the regulations within the scope of the *Canadian Environmental Assessment Act*, opening the door to formal impact assessment requirements. There is no obvious reason at this time, however, to take that step. The New Substances Notification Regulations should provide sufficient testing and assessment of the potential risks to human health and the environment of any new chemical or other substance before it is used in weather modification. These regulations are expected to be in force before the end of 1993 under the *Canadian Environmental Protection Act* (CEPA).

Team Findings

1. These regulations should be retained. No valid alternative has been identified to replace the current approach; some improvements can be pursued in the short term.
2. There are no competitiveness issues related to these regulations.
3. The regulations could be amended to extend the period between the filing of a weather modification intention and the activity itself to 30 days from 10 days, with recourse to a shorter period in the event of an emergency.

4. A second minor amendment to the regulations would be to replace reference to the *Clean Air Act* with reference to section 7(c) of the New Substances Notification Regulations under CEPA.
5. Further consultations regarding strengthening the WMIA and its regulations would be useful, but this is not a priority at this time.

INTERNATIONAL RIVER IMPROVEMENTS REGULATIONS

(C.R.C. 1978, Vol. X, C-982)

Regulatory Profile

The International River Improvements Regulations (IRIR) were established in 1955 under the *International River Improvements Act* (IRIA) and provide the Minister of the Environment with the authority to license projects affecting the flow of rivers from Canada into the United States. Exceptions are projects initiated by a federal parliamentary act; situated on boundary waters; or intended for domestic or irrigation purposes. Also excepted are projects designed as temporary measures, and those with minor impact on stream flows (less than 0.3 cubic metres per second) and water levels (less than 3 centimetres) at the international boundary.

The prime objectives of the Act and regulations are to ensure that the long-term national interest in development of transboundary rivers is safeguarded, and that international obligations under the Boundary Waters Treaty are met.

In 1985, the Standing Joint Committee of the Senate and House of Com-

mons for the Scrutiny of Regulations found that several sections of the regulations were *ultra vires*. After an in-depth review, Environment Canada moved to amend these sections, revoking the Minister's authority to inspect and to require information on the operation of an international river improvement.

To apply for a licence, proponents must submit information on the location and description of the works, impacts on water flows and levels at the border, and uses outside Canada; and they must provide a brief economic analysis. If the project is intended for electricity production and sale outside Canada, details of the sales agreement are to accompany the application, along with a copy of the licence issued by the appropriate provincial authority. To ensure compliance with the terms of a licence, occasional reports are requested on the operation of works.

The International River Improvements Regulations support federal obligations under Articles II and IV of the Boundary Waters Treaty that relate to downstream impacts and legal redress for damages. There is no U.S. equivalent to the IRIA and regulations, largely because of other strong legisla-

tion at the federal level, and because treaties in accordance with the U.S. Constitution override contrary practices by any level of government or private interest.

Since 1955, 14 licences and 47 certificates of exception have been issued. The latter are no longer required according to a 1987 amendment to the regulations. Since 1989, only two licences have been issued and two are pending.

The processing of licence applications in recent years has taken longer because all IRIA licensing now requires federal environmental assessment, as a result of a series of court decisions on the Rafferty-Alameda and Oldman dam projects in western Canada.

If a licensee fails to comply with the terms and conditions, the Minister may cancel an IRIA licence after giving 6 months written notice. However, there has been no case of a cancellation of a licence for this reason or a refusal to grant a licence to an applicant who agreed to its terms.

The current practice is not to issue an IRIA licence until all other federal and provincial approvals are in place.

Stakeholder Views

External stakeholders consulted during this review included representatives from industry, power corporations, provincial and federal agencies, and

nongovernmental organizations. A view expressed by some stakeholders is that the IRIR will be redundant with the forthcoming proclamation of the *Canadian Environmental Assessment Act* and its regulations. Another comment was that Canada may be at a competitive disadvantage if there is no equivalent U.S. legislation. A third comment was that the Act itself, rather than the regulations, should be amended to be more comprehensive, even though in its present form it has potential utility to protect Canadian water resources from large-scale export.

The consensus among regional officials in Environment Canada was that the IRIA and the IRIR would be more useful if amended to also cover boundary waters and their tributaries. This was, in fact, a recommendation of the International Great Lakes Levels Reference Study Board in March 1993. The question was also raised whether IRIA licences should address mainly water conditions or all environmental aspects of a project. The departments of External Affairs, and Fisheries and Oceans were also consulted.

Assessment and Analysis

The regulations ensure that the construction and operation of international river developments are carried out in an orderly manner that does not compromise Canada's national interest. To the extent that there is redistribution of benefits under the regulations, it is in favour of all Canadians.

Costs to industry or to other levels of government for compliance with the regulations are modest. However, time and costs associated with the federal environmental assessment process (which is triggered by the licensing process under the IRIA) are sometimes substantial.

Competitiveness is not a prime consideration of the IRIA and the IRIR. The focus is on national interest and international obligations, rather than on commerce. The regulations conform to treaties and agreements respecting the use and control of international waterways.

The review process for licence applications under the IRIR and, more importantly, the environmental screening process that it triggers promote environmental sustainability in line with Green Plan objectives.

There is no duplication with provincial regulations. The latter deal with licences to develop and use water, but not with the international aspects that are the main focus of the federal regulations. IRIR terms and conditions are coordinated with provincial terms and conditions for each project to eliminate potential overlap and duplication.

The team considered three basic options: repeal the Act, retain the status quo, and strengthen and expand the regulations. Each had positive and negative consequences in relation to competitiveness and environmental sustainability.

If the Act were repealed, the costs associated with administering the Act (minimal) would be eliminated, as would the costs associated with the federal environmental assessments (potentially significant) that licensing under the Act entails.

The costs of provincial assessments would not be eliminated. Through agreements with the provinces, overlap in the area of environmental assessments can be minimized, as can associated costs. However, with this option, the government would be reducing its capability to uphold its obligations under the Boundary Waters Treaty with the United States. As well, it could not ensure that impacts on fisheries and other federal interests would be satisfied under provincial environmental assessment.

The status quo has the disadvantage that the Act applies to transboundary but not boundary waters or tributaries; it also applies to nonconsumptive but not consumptive uses, and to projects changing water levels and flows but not water quality.

Several improvements could be examined:

- add the authority for site inspection and information collection to the regulations to enable the monitoring of the terms and conditions of licences;
- extend the Act's application to boundary waters and tributaries of boundary waters in addition to

rivers flowing from Canada into the United States;

- broaden the scope of the Act to include consumptive uses such as irrigation projects; and
- include other environmental considerations such as water quality.

These changes would respond to longstanding issues with respect to Canada's obligations under the

Boundary Waters Treaty. They would also authorize activities that were previously carried out that have been stopped because the regulations do not authorize site inspections and information collection in relation to licences. Giving authority for broadening the environmental base of the Act may well improve environmental sustainability, but such a far-reaching proposal would need intense study and wide consultation before being considered further.

Team Findings

1. The Act should be strengthened to allow the Minister the powers of site inspection and of ordering periodic reports on the operation of an improvement. Also, the scope could be broadened to include boundary waters and tributaries to boundary waters, major consumptive uses such as irrigation, and effects on water quality.
2. Before any changes are proposed, extensive consultations would be required with private industry, provincial and federal government departments, Crown corporations, and nongovernmental organizations.

OCEAN DUMPING REGULATIONS, 1989 (SOR/89-500, 1975)

Regulatory Profile

Canada signed the London Convention (1972) on ocean dumping in 1976. The Convention requires all signatories to have domestic legislation in place to meet the minimum requirements. The department reports annually to the Convention on the quantity and type of wastes disposed of under the permits issued.

The *Ocean Dumping Act* and its regulations reflect this commitment.

They were enacted by Parliament in 1975 with the objective of protecting Canada's marine environment by restricting disposal at sea of substances harmful to marine ecosystems. In 1988, the *Ocean Dumping Act* was incorporated, as Part VI, into the *Canadian Environmental Protection Act* (CEPA). The regulations prohibit the disposal of high-level radioactive wastes and chemical and biological warfare materials in the oceans surrounding Canada and limit the concentration of other substances in wastes approved for disposal to trace quantities. The regulations do not apply to land-based sources of

marine pollution or discharges that are incidental to the normal operation of ships, aircraft, platforms, and other anthropogenic structures; these are regulated by the *Fisheries Act* or the *Canada Shipping Act*.

Under the regulations, applicants need a permit to dispose of material at sea. The permit application requires information on the type of material, the concentration of certain substances, the load, the disposal site and so on. Environment Canada reviews the applications and assesses the potential environmental effects of allowing the proposed disposal. A permit may be granted for a maximum of one year when the assessment indicates little or no adverse effects on the marine environment. Each permit requires the proponent to report within a specific time frame on the dates of disposal, the total quantity of material disposed, and the equipment used.

The regulations are currently under review as part of the Ocean Dumping Control Action Plan, which is a Green Plan initiative. A proposed amendment to the application forms and the fee structure was published in *Canada Gazette*, Part I on March 20, 1993.

The National Inspection Plan establishes the number of inspections to be carried out for each region under CEPA. In the Atlantic and Quebec Regions combined, approximately 150 permits are issued annually, 20 per cent of which are inspected. In the Pacific and Yukon Region, approximately 50 permits are issued annually and 15 per cent are inspected, and in

the Western and Northern Region, 1 to 5 permits are issued annually and all are inspected.

The ocean disposal program is not operated on a cost-recovery basis. However, the Phase I amendments to the regulations will increase the application fee for a permit from the present \$50 to \$1000 sliding scale to a set fee of \$2500, which is the estimated average cost for processing a permit. Future recovery of monitoring costs is being considered for the Phase II amendments.

Stakeholder Views

Recent Reviews

An internal program review and the 1990 Auditor General's report identified that, prior to the Green Plan, insufficient resources were allocated to the ocean disposal program to enable adequate monitoring of compliance and environmental effects. Green Plan resources have been directed to improve the scientific basis for the regulations, improve monitoring at disposal sites, and ensure more efficient permit adjudication.

In February 1992, the ocean disposal program completed extensive consultations on the Phase I amendments. While industry and government agencies directly affected were not in favour of increasing application fees, they accepted the fee increase, since it was designed to cover the costs of processing permit applications. Environmental groups favoured increasing the application fees even more.

Current Review

In view of the extensive consultations on the Phase I amendments and the consultations scheduled for 1993-94 on Phase II amendments, a restricted list of 15 stakeholders was drawn up. These stakeholders were then contacted for input to the current regulatory review. Five stakeholders identified the following concerns:

- the regulations' lack of flexibility, particularly with respect to the rejection limits for controlled substances;
- potential negative impacts on competitiveness resulting from the prohibition on disposal of contaminated dredge spoils at sea. Land disposal is more costly than disposal at sea, which may preclude the dredging of some shipping channels. This in turn could reduce the load of vessels visiting ports. Also, land disposal has negative economic impacts for some industries, such as pulp and paper;
- the fact that land disposal is just moving the problem elsewhere;
- the amount of time taken to process permits; and
- the need for an appropriate mix of ecosystem planning, regulation, and use of "polluter-pay" instruments to stop pollution at source.

Most respondents acknowledged that the Act and regulations protect the environment and enhance environ-

mental sustainability. They also recognized that the proposed Phase II revisions would address concerns about the rejection limits for disposal at sea.

Assessment and Analysis

The Act and the regulations do not duplicate or overlap the efforts of other governments or federal agencies. The provinces and territories do not have regulations to control disposal at sea. The environmental problems addressed by the regulations are managed jointly with other government departments and with provincial representation through the Regional Ocean Disposal Advisory Committees. The Committees, which evaluate applications, are chaired by Environment Canada.

The cost to applicants for obtaining permits and complying with the regulations is small in comparison with the total cost of dredging projects. The application fee for a permit to dispose of dredge spoils at sea is less than 1 per cent of the total cost, and dredged spoils constitute the greatest volume (80 per cent) of material disposed of at sea. In general, when permits are sought, disposal at sea is the least expensive alternative for disposal. Tipping fees and transportation costs to landfills are normally five to ten times higher than ocean disposal.

In 1992, 55 per cent of the permits issued were for the disposal of fish waste. It is acknowledged that the increased application fees will place

greater pressure on the fishing and fish processing industries to seek alternatives to ocean disposal and to direct more wastes to production of fish meal and silage for animal feeds.

The Ocean Dumping Regulations and proposed amendments do not impose any barriers or disincentives to industry to develop or use new technologies. Dredging to maintain safe navigation channels for Canada's ports and harbours is not an area where technology development plays an important role. On the other hand, the fishing industry will likely explore new and better technologies to improve the economics of fish meal production.

The regulations are consistent with those of Canada's major trading partners, all of whom have similar regulations as part of their obligations under the London Convention. The regulations are achieving the intended objectives of protecting Canada's marine environment, human health, and other legitimate uses of the sea. They support the Green Plan initiatives for clean air and water, and they continue to meet Canada's international commitments.

The beneficiaries of the regulations are the Canadian public, the commercial fishing, tourism, and recreation industries, and those who use the oceans for other purposes. They result in protection of the public interest by controlling activities that would otherwise result in degradation of the oceans.

The level of compliance and enforcement of the regulations has been adequate. However, the Department has not, in the past, undertaken sufficient monitoring of the effects of ocean disposal. The Ocean Dumping Control Action Plan initiatives are addressing this issue, and monitoring programs are being developed and implemented.

During the review, alternatives to the regulatory approach were examined. The review team concluded that voluntary approaches, such as performance standards and industry self-reporting, could not adequately satisfy the federal government's international commitments and constitutional responsibilities. In addition, the consensus was that the public would not likely support a reduction of regulatory control and might perceive deregulation as giving industry a licence to pollute.

Market mechanisms such as tipping fees or charges, which are currently under review in the Phase II amendments to the regulations, could be considered, but only as a supplement to the regulatory regime. Such charges, by increasing the costs of disposal at sea, may further encourage industry to re-use or recycle waste materials (e.g., fish wastes converted to fertilizers) and to consider alternatives to ocean disposal.

The review team considers that the currently proposed amendments would introduce more flexibility into the regulatory regime by replacing the

current chemical-based rejection levels with an effects-based approach, using

marine sediment quality guidelines and biological testing.

Team Findings

1. The Ocean Dumping Regulations should be retained.
2. The current process to revise and amend the regulations should continue as planned.
3. Efforts to improve program efficiency should continue to be investigated, including computerizing application processes and establishing polluter-pay mechanisms.

PHOSPHORUS CONCENTRATION REGULATIONS (SOR/89-501)

Regulatory Profile

The development of controls on phosphates in detergents originated from concern about eutrophication in the lower Great Lakes. Eutrophication, or rapid algal growth, was the subject of extensive study during the late 1960s. The International Joint Commission identified phosphorus as a major contributor to eutrophication and detergents as a main contributor to the phosphorus loading in municipal wastewater.

Phosphorus Concentration Control Regulations were first promulgated under Part III of the *Canada Water Act* in 1970. Maximum phosphorus content of laundry detergents was limited to 8.7 per cent elemental phosphorus by weight, or 20 per cent as phosphorus pentoxide; in 1973, these concentrations were reduced to 2.2

per cent and 5 per cent, respectively. Before controls, phosphorus pentoxide content in laundry detergents averaged about 25 per cent.

In 1989, the regulations were moved substantially unchanged to the *Canadian Environmental Protection Act*, and their name was changed to the Phosphorus Concentration Regulations.

There are no reporting requirements for industry under these regulations.

The regulations complement other means and programs for reducing phosphorus loading of watercourses. In particular, the Canada-U.S. Great Lakes Water Quality Agreement of 1972 (revised 1978) focuses on reducing levels of phosphorus through improved municipal waste treatment, regulation of industrial discharges, reduction from diffuse sources, and a research program. In addition, reduction of phosphorus in household detergents to 0.5 per cent by weight

was called for where necessary to meet specific lake-loading allocations or local conditions. In the amended Canada-U.S. Agreement of 1987, priority is given to continuing efforts to limit phosphorus in household detergents.

There are no comparable provincial regulations for controlling phosphorus. Many municipalities bordering the Great Lakes and some in other parts of Canada have introduced phosphorus removal in their sewage treatment, but only about one-third of the Canadian population is served in this way.

A number of Canada's major trading partners have introduced phosphorus controls. In the United States, various states around the Great Lakes control phosphorus in detergents and other cleaning compounds, and an increasing number of cities elsewhere are doing the same. State regulations are generally tougher than the Canadian regulations (i.e., the maximum allowable concentration of phosphorus in laundry detergents is normally 0.5 per cent by weight as elemental phosphorus compared with 2.2 per cent in Canada).

Other countries have varying restrictions. Consumer pressure in Japan was enough to replace phosphates in cleaning products several years ago. A voluntary agreement between industry and government in Belgium has resulted in over 90 per cent of detergents being phosphorus-free; a similar process and result emerged in the Netherlands. Britain and France have no specific regulations for

phosphates; Finland taxes phosphorus in fertilizers.

In 1973, a network of inspectors was formed to collect and analyze samples of laundry detergents annually. Violations have been infrequent.

Stakeholder Views

The Soap and Detergent Association of Canada and a number of large and small detergent manufacturers were canvassed, along with environmental and recreational groups. All accepted that phosphorus loading of Canadian waterways occurred from various sources and must continue to be reduced. But the detergent industry said that the Phosphorus Concentration Regulations were unfair in targeting laundry detergents. In particular, the industry wanted to shift the emphasis to increased sewage treatment and to consumer choice between products containing phosphates and phosphate-free products.

Departmental officials, among others, noted the success of the current regulations and industry's compliance with them. Some regions expressed interest in expanding coverage to other products, such as automatic dishwasher detergents and other cleaning agents.

Assessment and Analysis

In their submission, members of the detergent industry argued that the regulations have imposed significant costs on the industry and hence the consumer, but they failed to substan-

tiate this claim. Detergent manufacturers have cooperated in achieving regulatory objectives. Recently, many companies have begun making non-phosphate laundry detergents, and the industry has cooperated in developing guidelines for laundry and automatic dishwasher detergents for the Department's Environmental Choice (Ecologo) Program.

The Phosphorus Concentration Regulations have been referred to frequently as one of Canada's success stories in environmental recovery. It is estimated that the regulations resulted in an 80 per cent reduction in the annual amount of phosphates discharged from all detergent sources. Prior to the regulations, influents to municipal sewage treatment plants had typical phosphorus concentrations of around ten milligrams per litre; following the regulations, concentrations dropped to around seven milligrams per litre.

Regional and municipal governments incur sewage treatment costs for phosphorus removal. If the detergent industry reverted to detergents with higher levels of phosphates, higher sewage treatment costs would be incurred to achieve the same effluent concentrations of phosphorus that currently exist. In addition, the regulations benefit smaller communities that cannot afford to control phosphate levels by sewage treatment.

The regulations have little effect on the development of new technologies, products, services, or markets. Since the regulations prohibit the import of

laundry detergents with more than 2.2 per cent phosphorus, they do not place Canadian detergent manufacturers at a disadvantage with respect to foreign manufacturers in the Canadian market. Canadian manufacturers do, however, face stricter controls when competing in certain U.S. markets.

As the regulations have no reporting requirement and companies are not required to submit samples to the government, the regulations do not impose unnecessary regulatory burdens on small communities or businesses.

The regulations do not duplicate any other regulations established by the federal government or other levels of government. The environmental problems addressed by the regulations are being handled in a complementary way by provincial and municipal governments (e.g., sewage control) and conservation authorities (e.g., educational material for rural land-owners).

By reducing phosphate loadings to lakes and rivers and helping to prevent eutrophication, the regulations support the Green Plan objective of clean water. They are based on "best available" scientific knowledge, and they represent a preventive approach with long-term cost advantages over remedial treatment of municipal and industrial wastes.

The team considered alternatives especially repealing the regulations, expanding them, using a tax on

phosphorus, and introducing required labelling for phosphorus content.

An immediate repeal of the regulations was considered too risky in terms of maintaining the very positive environmental effects produced by the regulations.

The regulations could be expanded to specify limits on the phosphorus content of other cleaning agents such as dishwasher detergents. This option, however, would be a continuation of the command and control philosophy. The whole issue of the current contribution to the eutrophication problem of this industry sector would have to be studied to decide whether this option would provide greatest benefit for dollars spent.

A tax on products containing phosphorus offers opportunity to further reduce phosphorus loading to Canadian waters by making alternative products more economical. The

tax could be adjusted over time to ensure results. Such a tax could be made revenue-neutral, with money funnelled back to the Canadian industry for use in research and development of products that are environmentally friendly. It could cover a broad range of products, including fertilizers.

Consumers are using their power to influence the market through their purchases. Product labelling is an important complementary way of attaining environmental goals. A percentage of the population is well informed on product choices and conscientiously buys products that are least harmful to the environment. An education program linked to phosphorus content labelling requirements would lead to increased awareness and less phosphate use. This could be an industry- or government-led initiative linked to any of the above alternatives.

Team Findings

1. The regulations should be retained.
2. A detailed study of phosphorus loadings from all sources and related effects would be needed to determine if eutrophication problems exist on a large scale. If significant problems exist, consultations could be undertaken to explore the options and to determine who (industry or federal, provincial, and/or municipal governments) is best placed to achieve the desired results.

**MEAT AND POULTRY PRODUCTS
PLANT LIQUID EFFLUENT
REGULATIONS (CRC, 1978, Vol. VII,
c. 818)
POTATO PROCESSING PLANT LIQUID
EFFLUENT REGULATIONS (CRC,
1978, Vol. VII, c. 829)**

Regulatory Profile

The Meat and Poultry Products Plant Liquid Effluent Regulations and the Potato Processing Plant Liquid Effluent Regulations were both promulgated in 1977 under sections 33 and 34 (now 36 and 43) of the *Fisheries Act*. They were intended to protect fish and other aquatic life from deleterious substances in the effluents from these plants.

The regulations apply to all new or expanded plants (i.e., since 1977). Baseline effluent standards were established for application across Canada, requiring the treatment of wastewaters through best practicable technology. Authorized deposit limits were established for biochemical oxygen demand, total suspended matter and pH for both industries. Oil and grease limits were also established for meat and poultry plants. The latter are also required to perform a fish bioassay test to determine the presence of any contaminants that might be acutely lethal to fish and to report regularly on the concentration of ammonia nitrogen.

Minor amendments to both sets of processing plant regulations are currently underway to satisfy a request from the Standing Joint Committee of

the Senate and House of Commons for the Scrutiny of Regulations to make them compatible with the Minister's authority under the *Fisheries Act*.

Provincial governments also regulate the discharge of effluents from food processing plants, employing variations on the application and approval approach, requiring industry to disclose details of its operations, wastewater strength, and treatment plans. In addition, many larger communities have bylaws covering industrial discharges to their sewers, and charge service fees for maintenance of their sewage and treatment facilities, as well as surcharges for discharge that exceeds set levels for effluent volume and strength.

The U.S. Environmental Protection Agency (EPA) has similar regulations for food processing plants. The EPA's Meat Products Point Source Category is less inclusive, however, in that it does not apply to poultry; but its Canned and Preserved Fruits and Vegetables Processing Point Source Category applies to more than potatoes. Another difference is that the EPA regulates all plants, including those existing before regulations were imposed and those discharging to municipal sewers.

During the three fiscal years from 1989-90 through 1991-92, there were only four inspections and one investigation of meat and poultry plants, and seven inspections of potato processing plant operations.

During the same period, there were a total of 2382 inspections and investigations under all *Fisheries Act* regulations.

To date, there has been one prosecution which failed twice to secure a conviction.

Stakeholder Views

Of the industry associations invited to comment on these regulations, only the Canadian Meat Council's Environment Committee did so (on behalf of 90 per cent of federally inspected red-meat processors). However, none of the poultry or potato processing industry associations responded; one firm did comment. Other comments were received from environmentalists and provincial officials.

The meat industry expressed three major concerns: smaller operations do not have the qualified personnel, facilities, or finances to perform the required sampling and testing protocols; federal treatment standards are superimposed upon provincial and municipal standards; and confusion exists over whether the regulations apply to all plants, including those discharging to municipal sewage treatment systems.

Provincial and environmental interest groups are also concerned about duplication of regulatory effort; a one-window arrangement among governments is essential so that plant operators can deal with one agency and one set of regulations or guidelines. Environmental groups

would like regulations to apply to all plants (not just new and expanded operations) and to be based on ambient water quality conditions (not just national effluent standards).

Internal review of the food processing regulations resulted in diverging comments. Some departmental officials support repeal of the regulations and their replacement by nonregulatory alternatives; others argue for their retention, with or without amendment, while negotiating arrangements for one-window administration.

Assessment and Analysis

The meat and poultry and potato processing plant effluent regulations were drafted in the mid-1970s during a period of growing concern about environmental protection. Baseline standards based on "best practicable" technology at that time were established for the industries' direct discharge. However, one important fact appears to have been overlooked: a majority of the effluents from food processing plants were, and still are, discharged into municipal sewers and treated off-site before returning to the environment.

For regulations that derive their authority from an Act intended to protect fish from direct discharge of deleterious substances, not satisfactorily addressing the municipal discharge issue opens the door for administrative problems. There is provision for exemption from the regulations for plants discharging to off-site treatment facilities. However,

the procedures are complex and have not been used. Failure to address and monitor off-site treatment is a significant weakness of these regulations; provincial and municipal regulations may be more effective.

Significant changes in the meat and poultry and potato processing industries have occurred since the regulations went into effect in 1977. Any costs to industry have been absorbed by now. The impact of these regulations on the industries' competitiveness or on environmental sustainability is probably negligible.

The team considered three basic options for these regulations: maintain the status quo, repeal the regulations, and delegate to the provinces.

Maintaining the status quo offers no improvement to a situation that begs to be improved. The current regulations are very difficult to administer, duplicate provincial and municipal regulations, offer little hope of further benefiting the environment, and provide no incentive to improve technology or to innovate.

The repeal of the federal regulations offers hope for more efficient achievement of environmental goals. The regulations are aimed at protecting fish. The general provisions of the *Fisheries Act* and current provincial and municipal controls are more than adequate to discourage uncontrolled waste discharges from this segment of the food processing sector. Development of a code of practice (by governments, industry, and non-governmental associations) on water reduction, conservation, good maintenance practices, and treatment needs and alternatives would provide a continued level playing field. Provincial regulations and permits could be based on this code.

The option to delegate responsibility to the provinces would reduce duplication. It does require the administrative cost of developing and maintaining the agreements and of ensuring that conditions are met. It is not apparent to the review team that this extra bureaucratic work would accomplish more than a repeal of the regulations would. This option is nevertheless more favourable than maintaining the status quo.

Team Findings

1. These federal regulations should be repealed and replaced with a national code of practice. Extensive consultations should be started to move away from the current regulatory regime. A study to update information on the restructuring of these industries may be useful to support future discussions.

APPENDIX F.1

Individuals and groups who participated in consultations or provided written submissions

Weather Modification Information Regulations

J. Rennick, Alberta Research Council
Director, Water Resources, Manitoba Department of Natural Resources
E.P. Lozowski, Meteorology, University of Alberta
Henry Leighton, Atmospheric and Ocean Science, McGill University
Marianne English, Alberta Department of Energy

International River Improvements Regulations

B.C. Hydro and Power Authority
B.C. Ministry of the Environment
External Affairs and International Trade Canada
Manitoba Department of Natural Resources
Prairie Farm Rehabilitation Administration, Agriculture Canada, Regina
Rawson Academy of Aquatic Science

Ocean Dumping Regulations

B.C. Ministry of the Environment
Brunswick Mining and Smelting Corp.
Canadian Coast Guard
Council of Forest Industries of British Columbia
External Affairs and International Trade Canada
Public Works Canada

Phosphorus Concentration Regulations

Diversey Inc.
Rideau Valley Conservation Authority
Soap and Detergent Association of Canada

Meat and Poultry Products Plant Liquid Effluent Regulations

Canadian Meat Council
Environmental Law Centre

Potato Processing Plant Liquid Effluent Regulations

Irene Novaczek, Winslow, P.E.I.
Les Croustilles Yum-Yum enr.

APPENDICES

APPENDIX 1**LIST OF REGULATIONS**

Canadian Environmental Protection Act

Asbestos Mines and Mills Release Regulations
Chlor-Alkali Mercury Release Regulations
Chlorobiphenyls Regulations
Chlorofluorocarbons Regulations
Contaminated Fuel Regulations
Export and Import of Hazardous Wastes Regulations
Federal Mobile PCB Treatment and Destruction Regulations
Fuels Information Regulations No. 1
Gasoline Regulations
Mirex Regulations
Ocean Dumping Regulations
Ozone-Depleting Substances Regulations No. 1 (CFCs)
Ozone-Depleting Substances Regulations No. 2 (certain BFCs)
Ozone-Depleting Substances Regulations No. 3 (products)
Ozone-Depleting Substances Regulations No. 4 (Methyl Chloroform and Carbon Tetrachloride)
PCB Waste Export Regulations
Petroleum Refinery Effluent Regulations
Phosphorus Concentration Regulations
Polybrominated Biphenyls Regulations
Polychlorinated Terphenyls Regulations
Pulp and Paper Mill Defoamer and Wood Chip Regulations
Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations
Secondary Lead Smelter Release Regulations
Storage of PCB Material Regulations
Toxic Substances Export Notification Regulations
Vinyl Chloride Release Regulations

Fisheries Act

Alice Arm Tailings Deposit Regulations
Chlor-Alkali Mercury Liquid Effluent Regulations
Meat and Poultry Products Plant Liquid Effluent Regulations
Metal Mining Liquid Effluent Regulations
Petroleum Refinery Effluent Regulations
Port Alberni Pulp and Paper Effluent Regulations
Potato Processing Plant Liquid Effluent Regulations
Pulp and Paper Effluent Regulations

International River Improvements Act

International River Improvements Regulations

Weather Modification Information Act

Weather Modification Information Regulations

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Environment Canada

W. Evan Armstrong
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George Cornwall, Director
Regulatory Review Office

Industry Sector

Jean Bélanger, President
The Canadian Chemical
Producers' Association

Kirke MacMillan, Vice President
Environment and Energy
Canadian Forest Products

George Miller, President
Mining Association of Canada

Gilles Courtemanche, Manager
Government Affairs
Imperial Oil Ltd.

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3M Canada Inc.

ENGOS

Howard Samoil
Environmental Law Centre, Edmonton

Gary Gallon, President
Canadian Environment Industry
Association - Ontario

Martin W. Janowitz, Executive Director
The Clean Nova Scotia Foundation

Labour

Richard Martin, Executive Vice President
Canadian Labour Congress

Institutions

Stephen Barg
Business and Government
International Institute for Sustainable
Development

Dr. Doug Bisset, General Manager
Environment Risk
Canadian Imperial Bank of Commerce

Wildlife Representative

Colin Maxwell, Executive Director
Canadian Wildlife Federation

Parks Representative

Gary B. Clarke, Chair
St. Lawrence Parks Commission

TERMS OF REFERENCE

Primary Objective

The purpose of the External Advisory Panel is to serve as a challenge function and to provide advice and input to Environment Canada for the departmental regulatory review.

Context

Environment Canada, directed by the 1992 Federal budget, is undertaking a review of regulations within its mandate to identify those that may hinder Canadian competitiveness or whose costs outweigh their benefits.

Responsibilities

1. The panel will review the draft Review Criteria, and suggest modifications as required.
2. The panel will review interim progress reports at panel meetings.
3. The panel will advise and provide input into the final report.

Advisory Role

The panel will not necessarily seek to achieve consensus on specific issues. The expertise of its members will ensure that the appropriate issues are being addressed.

Composition

The External Advisory Panel will be comprised of industry, ENGOs, organized labour, and institutional representatives of the Advisory Committee on Environmental Protection (ACEP), and of other individuals covering the perspectives of the department's wildlife and parks programs.

Directed by the 1992 Federal Budget, federal government departments are undertaking a review of regulations within their mandates to identify those that may hinder Canadian competitiveness or whose costs outweigh their benefits. At the same time, the Minister responsible for regulatory affairs has instructed that none of the reviews will be allowed to compromise the government's commitments to safety, health and the environment. The objective of Environment Canada's review process is to develop recommendations relating to potential regulatory change to ensure that its regulatory framework operates in the most efficient and effective way in the face of changes affecting government and industry alike - the globalization of the world's economy and overall federal government fiscal restraint.

The departmental regulatory review is particularly timely for Environment Canada. Debate over the appropriate instruments to implement environmental policies that at the same time enhance the competitiveness of industries is one of the major environmental issues of the 1990s. Employing effective instruments to promote sustainable development is also one of the key objectives of the Green Plan. This is a unique opportunity to ensure that our regulatory instruments fit the current economic and environmental circumstances. The regulatory review criteria have been developed with this viewpoint in mind.

The review criteria are designed to provide information documenting the legal basis, objectives, control measures and history of regulations, as well as the extent of government involvement and a review of the comparable situation in the provinces, territories, and other countries. They are also designed to assist in the analysis of the impacts of regulations. In addition to competitiveness, the questions relate to obsolescence, duplication, cooperation with industry, benefits, industrial compliance costs, environmental sustainability, and alternatives to existing regulations.

The review criteria are designed to be comprehensive. It is possible, however, to screen out some regulations from assessment against the complete review criteria. Early on in the review process, some regulations may be seen to be obsolete because of Canada's changing circumstances. In such cases where recommendations for deregulation without any negative impact can be made, the regulations may not have to be subjected to the remaining review criteria. It is those regulations for which there is justification for intervention by Environment Canada that the remaining review criteria have been designed.

The intent of much of the remaining review criteria is to assess regulation's impact on industry's ability to compete on both a domestic and international level and to ensure that we are meeting our environmental objectives in the best way and at the least cost. Comparative information and analysis of the regulatory costs and practices of Canada's major competitors as well as of how well Canada's regulations support environmental sustainability will provide a yardstick against which we can measure the appropriateness of our regulatory instruments. Many of the recommendations flowing from the review criteria, particularly those that relate to alternative approaches, will be future oriented. Such recommendations may guide the regulatory direction of Environment Canada in the years ahead.

REGULATORY REVIEW CRITERIA

A. Background Information Required to Proceed with the Analysis of Impacts

1. **Legal Basis and Regulatory Objectives:** Outline the objectives, intended benefits (both short and long term), control measures and approaches used to achieve the objectives, and the regulatory history for the set of regulations.
2. **Reporting Burden:** Outline the reporting requirements of the regulations.
3. **Level of Government Involvement:** Outline the 1989/90, 1990/91, 1991/92 and 1992/93 government expenditure in human and financial resources, chart the historical trend of government expenditure, and indicate, if any, the level of cost recovery.
4. **Enforcement and Compliance:** Outline the level of enforcement and compliance of the regulations, for example, the numbers of inspections.
5. **International Requirements:** Outline how these regulations are required in order to comply with existing or proposed provisions of international or bilateral environmental treaties, conventions, agreements, or memoranda of understanding.
6. **Comparable Situation in other Federal Departments, the Provinces and Territories:** Describe the regulatory situation of other federal departments, the provinces and territories with respect to similar objectives addressed by these regulations.
7. **Comparable Situation in other Countries:** Describe the regulatory situation of major trading partners and competitors with respect to similar objectives addressed by these regulations. Include any alternative approaches currently in use or proposed for use - for example, effluent taxes and tradable emission permits - their degree of effectiveness, and applicability to Canada.

8. **Stakeholder Concerns:** Outline any concerns expressed by industry or production sectors, consumers, lobby groups, environmentalists, or major trading partners about the development, purpose, and/or functioning of the regulations.

B. Analysis of Impacts -- respond to the following questions

1. **Obsolescence:** Are there regulations that no longer serve the intended purpose?
2. **Cooperation with other Governments (of the provinces, territories, municipalities, major trading partners):** Do the regulations duplicate the effects or objectives of other regulations established by the federal government or by another level of government?

Can the environmental problems, addressed by the regulations, be handled by another level of government, or handled jointly with others?

3. **Cooperation with Industry:** Could the objective that this regulation is intended to achieve be accomplished more effectively by industry on its own initiative, or in cooperation with industry?
4. **Compliance Costs (to industry, provinces, territories or municipalities):** What are the current costs to industry, provinces, territories or municipalities, as well as the historical trend of their costs, of compliance with the regulations?
5. **Benefits:** Are the regulations creating the intended objectives/benefits? If not, are the regulations still providing more benefits than costs?

Who are the beneficiaries of the benefits?

Do the regulations redistribute income from one group, region, or firm to another?

6. **Competitiveness:** Do the regulations impose barriers and disincentives, or incentives, to industry's development and use of new technologies, products, services, and markets - for example, barriers such as technology-based standards, reliance on "available technology", or uncertainty regarding product and cleanup liability?

Do the regulations impose unnecessary regulatory burdens on small communities and small businesses (given their limited financial, technical and institutional revenues), for example, the amount and type of information that must be reported to regulatory agencies?

Do the regulations conform to, or violate, existing provisions of international trade agreements, such as the General Agreement on Tariffs and Trade (GATT), the Canada/U.S. Free Trade Agreement (FTA), or the North American Free Trade Agreement (NAFTA); and are they the least trade restrictive measure that will achieve the environmental objective?

Are the regulations consistent, more stringent, or less demanding than those adopted by major trading partners and competitors?

Do the regulations result in higher adjustment costs to Canadian industry than those of our major trading partners and competitors with respect to similar environmental objectives? How significant are these adjustment costs in terms of total production costs; and to what extent are they offset in the short and long term by productivity gains and increased access to new market opportunities?

Do the regulations enable industry to respond in a timely fashion to market demands, particularly for new products?

Do the regulations create or resolve current issues related to green consumerism, for example, the potential for a boycott of Canadian forest products in European markets?

Do the regulations discriminate between domestic and imported products? If so, how?

Do the regulations impede or enhance Canadian or foreign investment in Canadian industry?

Do the regulations impose internal barriers to trade and investment within Canada?

7. **Environmental Sustainability:** Do the regulations promote or hinder the quality of the environment that is necessary to provide a strong and competitive economy? More specifically, to what extent do the regulations support the Green Plan objectives and goals (clean air, water and land, sustainable use of renewable resources, maintenance of ecological integrity of our special spaces and species, preserving the integrity of the North, global environmental security, minimizing impacts of environmental emergencies)?

Is the level of enforcement and compliance adequate to promote environmental sustainability?

Do the regulations meet the existing or proposed provisions of international environmental agreements, such as the Montreal Protocol, or the conventions on climate change and biodiversity; and, are such provisions consistent with the objectives of competitiveness?

In the development of the regulations and their application, were inclusionary consultation processes incorporated, for example, among government departments at all levels, and among industry, government, labour, environmentalists, and aboriginals?

Are the regulations based on best available scientific knowledge?

Do the regulations provide flexibility for the development, adoption and diffusion of new, more efficient and cleaner production processes and products, thereby facilitating pollution prevention as opposed to "after the fact" clean-up – for example, are regulations aimed at desired outcomes or at prescribing how regulatory objectives are to be achieved?

Do the regulations provide barriers or include incentives for the development and use of relatively low risk products and production processes, for example, alternative transportation fuels technologies, such as natural gas?

Do the regulations provide barriers or promote the development and use of emerging technologies that could be used to achieve cleaner and more efficient alternatives to wasteful production processes and polluting products, for example, biotechnology?

Have regulations been identified that have fostered innovation and the development of domestic and internationally competitive products and services that could be used to a greater extent?

8. **Alternatives:** Are there alternative approaches to the existing regulation that could be effective in terms of achieving the intended benefits, such as the use of market instruments, performance standards or industry self-regulation?

C. Recommendations

1. **Implications for the Role of Government:** Taking into consideration the background information outlined in Section A, the answers to the questions in Section B, and the "Guiding Assumptions" outlined in the attached appendix, respond to the following questions.

Is government intervention justified? If so, should it be a federal responsibility; and, is it the responsibility of Environment Canada to intervene?

Is this an area where alternative approaches could be immediately proposed, tested using demonstration projects or presented as viable options to the public?

If not, are there more efficient ways to deliver the existing regulation?

2. Options for Action:

- (I) Obsolete Regulations: List the regulations that could be immediately deregulated without any negative impacts.
- (II) Regulatory Change: Position the regulations for which changes are recommended in one or more of the following regulatory change categories. Outline and discuss the options available for working towards the recommended changes. Identify the preferred option to proceed with if analyses and consultations have been completed, or identify where further study and consultation are required.

Phased Deregulation: Environment Canada will no longer regulate in these areas. However, phasing must occur to lessen the negative impacts of deregulation for Canadian-based market participants.

Sharing of Responsibilities: New regulating and/or enforcing arrangements are required with other federal departments, provincial, territorial or municipal governments, industry, or international collaboration.

Modification or Improvements: Environment Canada retains current regulating responsibilities although some changes would improve the regulations or their application.

- (III) Regulations Proposed for Retention: Identify the regulations that do not require change, and explain why they should be maintained.

Guiding Assumptions

The criteria for assessing the regulations are built on the assumptions listed below.

1. In accordance with Treasury Board policy on regulations, which state that when regulating, departments must consider that:

- government intervention remains justified;
 - regulation is the best of available alternatives;
 - the regulatory program provides maximum gain to beneficiaries in relation to the cost to Canadian governments, businesses and individuals;
 - resources are available to ensure effective compliance and enforcement; and
 - stakeholders must be informed and involved with the regulatory review and change process.
2. In applying the criteria, impacts of regulations must be consistent with the intended objectives of the regulations and the legislation.
 3. The regulations must reflect the government's competitiveness goals.
 4. The regulations must reflect the government's environmental sustainability goals as outlined in the Green Plan.

POLICY OBJECTIVE

THE OBJECTIVE OF THIS POLICY IS TO ENSURE THAT USE OF THE GOVERNMENT'S REGULATORY POWERS RESULTS IN THE GREATEST NET BENEFIT TO CANADIANS.

POLICY STATEMENT

It is government policy that departments and agencies:

- justify the need for regulation;
- weigh the benefits of the regulations against their cost;
- establish the framework (compliance and enforcement policies, management systems and resources) needed to implement regulatory programs;
- determine the relevance, success and cost-effectiveness of existing regulatory programs; and
- provide for an open regulatory process.

APPLICATION

This policy applies to federal regulatory authorities.

POLICY REQUIREMENTS

For existing regulatory programs, and substantive new or amended regulations, ***departments and agencies must demonstrate that:***

1. A problem or risk exists, government intervention is justified, and regulation is the best alternative.
2. Canadians have been consulted and have had an opportunity to participate in developing or modifying regulations and regulatory programs.

3. The benefits of the regulatory activity outweigh the costs, and the regulatory program is "structured" to maximize the gains to beneficiaries in relation to the costs to Canadian:
 - governments,
 - businesses, and
 - individuals.
4. Steps have been taken to ensure that the regulatory activity impedes as little as possible Canada's competitiveness.
5. The regulatory burden on Canadians has been minimized through such methods as cooperation with other governments.
6. Systems are in place to manage regulatory resources effectively. In particular:
 - compliance and enforcement policies are articulated, as appropriate;
 - resources have been approved and are adequate to discharge enforcement responsibilities effectively, and to ensure compliance where the regulation binds the government.

RESPONSIBILITIES

Central agencies have a responsibility to assist departments to implement the above Policy Requirements and to ensure an efficient and timely regulatory process.

MONITORING

The Treasury Board Secretariat will monitor departmental performance and the effectiveness of this policy. To do this, the Secretariat will rely on existing sources of information, including, where appropriate, the Federal Regulatory Plan, the departmental Multi-Year Operational Plans, Treasury Board submissions, major regulatory initiatives for Cabinet consideration, proposals going through the regulatory process, formal program evaluations and results of internal audits.

In addition, where appropriate, the Secretariat will utilize the work of third parties (e.g. Office of the Auditor-General) to assist in determining the degree of compliance with this policy.

ENQUIRIES

Enquiries about this policy should be directed to the Regulatory Affairs Directorate, Treasury Board of Canada Secretariat: (613) 952-3459

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